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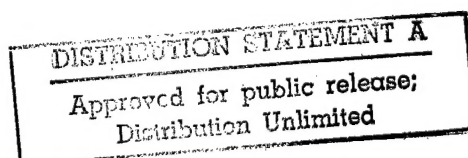
Data for DoD compliance with the Federal Methodology for Life-Cycle Cost Analysis, Title 10, CFR, Part 436, Subpart A, and OMB Circular A-94

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Prepared for:
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This document provides 45 tables of present worth factors to be used in computing the present worth of future costs (or cost reductions) in economic analyses of design decisions for projects in the DoD Military Construction Program. These factors are especially useful for the life-cycle cost analysis of investments in buildings or building systems which are intended to reduce future operating, maintenance, repair, replacement, and energy costs over the life of the facility. The tables include present worth factors for both one-time costs and annually recurring costs, based on the FEMP discount rate of 4.0% (FY 1993) for energy-related studies and on the OMB discount rate of 10.0% for non-energy studies. Forecasts of future energy prices used in the calculation of present worth factors for energy costs were provided by the Energy Information Administration.

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October 1992

PREFACE

On March 18, 1991, the Army, Navy, and Air Force signed a Memorandum of Agreement (MOA) on Criteria/Standards for Economic Analysis/Life-Cycle Costing for MILCON Design. The stated purpose of the MOA is to establish criteria and standards for performing economic analyses (EAs) and life-cycle cost (LCC) studies in support of design decisions for projects in the Military Construction (MILCON) Program; i.e., to support the selection from various alternatives of components/systems being considered as elements in facilities design. Since 1991 the criteria/standards package represented by the provisions of the MOA has been adopted and specified for use in conjunction with several other Department of Defense (DoD) applications. For example, the Office of the Secretary of Defense has specified that EAs conducted in support of project-justification decisions for ECIP (Energy Conservation Investment Program) projects be based on this same criteria/standards package.

The criteria and standards in the MOA are responsive to, and completely consistent with, the requirements of all governing statutes, executive orders, and regulations, including for example those of 10 CFR 436A (for energy studies) and OMB Circular A-94 (for non-energy studies). A copy of the provisions of the MOA is provided in Appendix A of this report.

The tables presented in this document are designed to be used in support of EAs/LCC studies conducted in accordance with the provisions of the MOA. These tables are considered to be valid and appropriate for all analyses/studies initiated during FY 93, and are authorized for use throughout that period. The present worth factors presented in the various recurring cost tables are based on an assumed Date of Study (DOS) of April 1993. These factors should be sufficiently accurate for use at any time during the fiscal year.

The present-worth factors in this report are consistent with the those in NISTIR 85-3273-7, Energy Prices and Discount Factors for Life-Cycle Cost Analysis 1993, the Annual Supplement to NIST Handbook 135, Life-Cycle Costing Manual for the Federal Energy Management Program. However, the present worth factors for DoD studies are more specific as to the date of study and the date of beneficial occupancy than those in NISTIR 85-3273-7. The DoD factors for annually recurring costs assume that the date of study is April 1993 and that the date of beneficial occupancy occurs in October of the current year or in October of a future year (up to 2002). The DoD tables for annually recurring costs are based on a mid-year discounting convention for all annually-recurring costs, while the corresponding tables in NISTIR 85-3273-7 are based on an end-of-year discounting convention.

The same forecast of regional energy prices provided by the U.S. Department of Energy's Energy Information Administration (EIA) for NISTIR 85-3273-7 were used in computing the energy-type-specific tables in this report. However, with one exception, these tables are based on forecasts of energy prices for the industrial sector only, while the tables in NISTIR 85-3273-7 are based on residential, commercial, and industrial forecasts. Price forecasts for liquified petroleum gas (LPG) in the residential sector were used for the DoD tables because industrial LPG price forecasts were not available from EIA.

For LCC analysis of Federal projects outside of the Department of Defense, especially those projects related to energy conservation and renewable energy resources, the present worth factors from NISTIR 85-3273-7 should be used. NISTIR 85-3273-7, as well as NIST Handbook 135, can be obtained from:

Advanced Sciences, Inc.
2000 North 15th Street
Suite 407
Arlington, VA 22201
(703) 243-4900 .

ABSTRACT

This document provides 45 tables of present worth factors to be used in computing the present worth of future costs (or cost reductions) in economic analyses of design decisions for projects in the DoD Military Construction Program. These factors are especially useful for the life-cycle cost analysis of investments in buildings or building systems which are intended to reduce future operating, maintenance, repair, replacement, and energy costs over the life of the facility. The tables include present worth factors for both one-time costs and annually recurring costs, based on the FEMP discount rate of 4.0% (FY 1993) for energy-related studies and on the OMB discount rate of 10.0% for non-energy studies. Forecasts of future energy prices used in the calculation of present worth factors for energy costs were provided by the Energy Information Administration.

ACKNOWLEDGMENTS

CONTENTS

Part I. Tables of Present Worth Factors for Energy Studies

Part I contains tables of present worth factors for use in computing the life-cycle costs of the competing alternatives in an energy-related study, in accordance with the provisions of governing DoD criteria (see Appendix A). These tables are all numbered in a sequence beginning with the letter "E" for energy.

Table E-1, "Present Worth Factors--One-Time Costs, Zero Differential Escalation," provides present worth factors for costs which occur one time or at irregular intervals throughout the study period. These costs include construction/acquisition costs, non-annually recurring maintenance costs, major repair and replacement costs, and retention/salvage value or disposal cost. These factors are called "single present worth" (SPW) factors. The present worth of each cost occurrence is found by multiplying that cost, in Date-of-Study (DOS) prices, by the SPW factor corresponding to the time of occurrence (years after DOS). Interpolation is encouraged for non-integer time periods.

Table E-2, "Present Worth Factors--Annually Recurring Non-Energy Costs, Zero Differential Escalation," provides present worth factors for all costs other than energy costs which are incurred annually throughout the study period in substantially the same amount each year (in constant dollar terms), such as routine maintenance and repair costs. These factors are called "uniform present worth" (UPW) factors. The factors in this table are based on the assumption that the DOS is in April 1993, the beneficial occupancy date is in October of the same year or a future year, and that the annual cost occurs approximately at mid-year during each year of occupancy, or represents the sum of several costs distributed relatively uniformly throughout the year. The present worth of a cost recurring annually over the study period is found by multiplying the annual amount, in DOS prices, by the appropriate UPW factor. The number of payments generally corresponds to the number of years in the study period after the beneficial occupancy date. Interpolation is encouraged for study periods and for beneficial occupancy dates other than those shown on the table.

Tables E-3-ET-R, where ET is the energy type code and R is the region number (R = 5 is for U.S. average), provide present worth factors for annually recurring energy costs. These factors are based on the assumption that annual energy usage/savings is constant from year to year, but that energy prices are changing over time, in accordance with the provisions of governing DoD criteria (see Appendix A). These factors are sometimes called "modified uniform present worth" (UPW*) factors. The UPW* factors in this table are based on the assumption that the DOS is in April 1993, the beneficial occupancy date is in October of the same year or a future year, and that the annual energy cost occurs approximately at mid-year during each year of occupancy, or represents the sum of several costs distributed relatively uniformly throughout the year. The present worth of an annual energy cost over the study period is found by multiplying the annual amount, in DOS prices, by the appropriate UPW* factor. The number of payments generally corresponds to the number of years in the study period after the beneficial occupancy date. Interpolation is encouraged for study periods and for beneficial occupancy dates other than those shown on the tables.

Table E-1. Present Worth Factors--One-Time Costs
Zero Differential Escalation (e = 0%)

Time Cost Incurred (Years after DOS)	SPW Factor	Time Cost Incurred (Years after DOS)	SPW Factor
0.00	1.0000	16	0.5339
0.25	0.9902	17	0.5134
0.50	0.9806	18	0.4936
0.75	0.9710	19	0.4746
		20	0.4564
1	0.9615	21	0.4388
2	0.9246	22	0.4220
3	0.8890	23	0.4057
4	0.8548	24	0.3901
5	0.8219	25	0.3751
6	0.7903	26	0.3607
7	0.7599	27	0.3468
8	0.7307	28	0.3335
9	0.7026	29	0.3207
10	0.6756	30	0.3083
11	0.6496	35	0.2534
12	0.6246	40	0.2083
13	0.6006	45	0.1712
14	0.5775	50	0.1407
15	0.5553		

Notes:

<1> Authorized Period of Use of Table is Oct 1992 through Sep 1993.
<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
Data Based on Discount Rate of 4.0% (NIST Annual Supplement to Handbook 135, Oct 1992).
<3> Covers Costs such as Construction, Procurement, Replacement, Disposal.

Table E-2. Present Worth Factors--Annually Recurring Non-Energy Costs
Zero Differential Escalation (e = 0%)

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9615	0.9246	0.8890	0.8548	0.8219	0.7903	0.7599	0.7307	0.7026	0.6756
2	1.8861	1.8136	1.7438	1.6767	1.6122	1.5502	1.4906	1.4333	1.3782	1.3251
3	2.7751	2.6684	2.5657	2.4670	2.3722	2.2809	2.1932	2.1088	2.0277	1.9497
4	3.6299	3.4903	3.3560	3.2270	3.1028	2.9835	2.8688	2.7584	2.6523	2.5503
5	4.4518	4.2806	4.1160	3.9577	3.8054	3.6591	3.5183	3.3830	3.2529	3.1278
6	5.2421	5.0405	4.8467	4.6602	4.4810	4.3087	4.1429	3.9836	3.8304	3.6831
7	6.0021	5.7712	5.5492	5.3358	5.1306	4.9333	4.7435	4.5611	4.3856	4.2170
8	6.7327	6.4738	6.2248	5.9854	5.7552	5.5338	5.3210	5.1163	4.9195	4.7303
9	7.4353	7.1494	6.8744	6.6100	6.3558	6.1113	5.8762	5.6502	5.4329	5.2240
10	8.1109	7.7989	7.4990	7.2106	6.9332	6.6666	6.4102	6.1636	5.9266	5.6986
11	8.7605	8.4235	8.0996	7.7880	7.4885	7.2005	6.9235	6.6572	6.4012	6.1550
12	9.3851	9.0241	8.6770	8.3433	8.0224	7.7138	7.4172	7.1319	6.8576	6.5938
13	9.9856	9.6016	9.2323	8.8772	8.5358	8.2075	7.8918	7.5883	7.2964	7.0158
14	10.5631	10.1568	9.7662	9.3906	9.0294	8.6821	8.3482	8.0271	7.7184	7.4215
15	11.1184	10.6908	10.2796	9.8842	9.5040	9.1385	8.7870	8.4491	8.1241	7.8116
16	11.6523	11.2041	10.7732	10.3588	9.9604	9.5773	9.2090	8.8548	8.5142	8.1867
17	12.1657	11.6978	11.2478	10.8152	10.3993	9.9993	9.6147	9.2449	8.8893	8.5474
18	12.6593	12.1724	11.7042	11.2541	10.8212	10.4050	10.0048	9.6200	9.2500	8.8943
19	13.1339	12.6288	12.1431	11.6760	11.2269	10.7951	10.3799	9.9807	9.5968	9.2277
20	13.5903	13.0676	12.5650	12.0817	11.6171	11.1703	10.7406	10.3275	9.9303	9.5484
21	14.0292	13.4896	12.9707	12.4719	11.9922	11.5309	11.0874	10.6610	10.2510	9.8567
22	14.4511	13.8953	13.3609	12.8470	12.3529	11.8778	11.4209	10.9817	10.5593	10.1532
23	14.8568	14.2854	13.7360	13.2077	12.6997	12.2112	11.7416	11.2900	10.8557	10.4382
24	15.2470	14.6605	14.0967	13.5545	13.0332	12.5319	12.0499	11.5864	11.1408	10.7123
25	15.6221	15.0212	14.4435	13.8880	13.3538	12.8402	12.3464	11.8715	11.4149	10.9759
30	17.2920	16.6270	15.9875	15.3726	14.7813	14.2128	13.6661	13.1405	12.6351	12.1492
35	18.6646	17.9467	17.2565	16.5928	15.9546	15.3410	14.7509	14.1836	13.6380	13.1135
40	19.7928	19.0315	18.2995	17.5957	16.9189	16.2682	15.6425	15.0409	14.4624	13.9061
45	20.7200	19.9231	19.1568	18.4200	17.7116	17.0304	16.3753	15.7455	15.1399	14.5576
50	21.4822	20.6559	19.8615	19.0976	18.3631	17.6568	16.9777	16.3247	15.6968	15.0931

Notes: <1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.

<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design.

Data Based on Discount Rate of 4.0% (NIST Annual Supplement to Handbook 135, Oct 1992).

<3> Covers Costs such as Routine Maintenance & Repair and Custodial.

Table E-3-EL-1. Present Worth Factors--Electricity

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9678	0.9402	0.9060	0.8742	0.8489	0.8249	0.8050	0.7878	0.7658	0.7407
2	1.9079	1.8462	1.7802	1.7231	1.6738	1.6300	1.5928	1.5536	1.5064	1.4588
3	2.8139	2.7204	2.6291	2.5480	2.4788	2.4178	2.3586	2.2943	2.2245	2.1569
4	3.6881	3.5693	3.4540	3.3530	3.2666	3.1835	3.0993	3.0123	2.9227	2.8353
5	4.5370	4.3942	4.2590	4.1408	4.0324	3.9242	3.8174	3.7105	3.6010	3.4934
6	5.3619	5.1992	5.0469	4.9066	4.7731	4.6423	4.5155	4.3889	4.2591	4.1294
7	6.1670	5.9870	5.8126	5.6473	5.4912	5.3405	5.1939	5.0469	4.8951	4.7423
8	6.9548	6.7528	6.5533	6.3654	6.1893	6.0188	5.8519	5.6829	5.5080	5.3380
9	7.7205	7.4935	7.2714	7.0635	6.8677	6.6769	6.4879	6.2959	6.1037	5.9175
10	8.4612	8.2115	7.9696	7.7419	7.5257	7.3129	7.1009	6.8915	6.6832	6.4781
11	9.1793	8.9097	8.6479	8.4000	8.1617	7.9258	7.6965	7.4710	7.2438	7.0205
12	9.8775	9.5881	9.3060	9.0360	8.7747	8.5215	8.2760	8.0316	7.7862	7.5452
13	10.5558	10.2461	9.9420	9.6489	9.3703	9.1010	8.8367	8.5740	8.3110	8.0529
14	11.2139	10.8821	10.5549	10.2445	9.9498	9.6616	9.3790	9.0988	8.8186	8.5441
15	11.8499	11.4951	11.1506	10.8240	10.5105	10.2040	9.9038	9.6065	9.3099	9.0194
16	12.4628	12.0907	11.7301	11.3847	11.0528	10.7287	10.4115	10.0977	9.7852	9.4792
17	13.0585	12.6702	12.2907	11.9271	11.5776	11.2364	10.9027	10.5730	10.2449	9.9239
18	13.6380	13.2308	12.8331	12.4518	12.0853	11.7276	11.3780	11.0328	10.6897	10.3541
19	14.1986	13.7732	13.3578	12.9595	12.5765	12.2029	11.8378	11.4775	11.1198	10.7702
20	14.7410	14.2980	13.8655	13.4507	13.0518	12.6627	12.2825	11.9076	11.5359	11.1727
21	15.2657	14.8057	14.3567	13.9260	13.5116	13.1074	12.7127	12.3237	11.9384	11.5620
22	15.7734	15.2969	14.8320	14.3858	13.9563	13.5376	13.1288	12.7262	12.3278	11.9386
23	16.2646	15.7722	15.2918	14.8305	14.3865	13.9537	13.5313	13.1156	12.7044	12.3028
24	16.7399	16.2320	15.7365	15.2607	14.8025	14.3562	13.9206	13.4922	13.0686	12.6550
25	17.1997	16.6767	16.1667	15.6768	15.2050	14.7455	14.2972	13.8564	13.4207	12.9954
30	19.2826	18.6914	18.1154	17.5616	17.0278	16.5080	16.0013	15.5039	15.0134	14.5352
35	21.0450	20.3955	19.7629	19.1543	18.5675	17.9966	17.4403	16.8950	16.3582	15.8351
40	22.5336	21.8345	21.1540	20.4990	19.8675	19.2533	18.6551	18.0694	17.4935	16.9326
45	23.7903	23.0493	22.3284	21.6343	20.9650	20.3142	19.6808	19.0609	18.4520	17.8592
50	24.8512	24.0750	23.3199	22.5928	21.8916	21.2099	20.5466	19.8979	19.2611	18.6414

Notes:

<1> Data Based on Assumed DOS of Apr 1993.
    Authorized Period of Use of Table is Oct 1992 through Sep 1993.

<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
    of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
    Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
    for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).

<3> Region 1: ME, NH, VT, MA, CT, RI, NY, NJ, PA

Table E-3-DO-1. Present Worth Factors--Distillate Oil

Number of Payments	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9691	0.9548	0.9463	0.9439	0.9419	0.9402	0.9388	0.9332	0.9225	0.9085
2	1.9239	1.9011	1.8902	1.8857	1.8821	1.8790	1.8720	1.8558	1.8310	1.8002
3	2.8702	2.8450	2.8320	2.8259	2.8209	2.8122	2.7945	2.7643	2.7227	2.6738
4	3.8141	3.7869	3.7722	3.7647	3.7541	3.7347	3.7031	3.6560	3.5963	3.5280
5	4.7560	4.7271	4.7110	4.6980	4.6766	4.6433	4.5948	4.5295	4.4506	4.3621
6	5.6962	5.6658	5.6443	5.6205	5.5852	5.5350	5.4683	5.3838	5.2846	5.1768
7	6.6350	6.5991	6.5668	6.5290	6.4769	6.4085	6.3226	6.2178	6.0993	5.9723
8	7.5682	7.5216	7.4753	7.4207	7.3504	7.2628	7.1566	7.0325	6.8948	6.7469
9	8.4907	8.4301	8.3670	8.2942	8.2047	8.0968	7.9713	7.8280	7.6695	7.5024
10	9.3993	9.3218	9.2405	9.1485	9.0387	8.9115	8.7668	8.6027	8.4249	8.2418
11	10.2909	10.1954	10.0948	9.9826	9.8534	9.7070	9.5415	9.3582	9.1643	8.9651
12	11.1645	11.0496	10.9289	10.7972	10.6489	10.4817	10.2970	10.0975	9.8877	9.6726
13	12.0188	11.8837	11.7435	11.5928	11.4236	11.2372	11.0363	10.8209	10.5952	10.3644
14	12.8528	12.6983	12.5391	12.3674	12.1790	11.9765	11.7597	11.5284	11.2869	11.0407
15	13.6675	13.4939	13.3137	13.1229	12.9184	12.6999	12.4672	12.2202	11.9632	11.7015
16	14.4630	14.2685	14.0692	13.8623	13.6418	13.4074	13.1590	12.8964	12.6240	12.3463
17	15.2377	15.0240	14.8086	14.5856	14.3493	14.0992	13.8352	13.5573	13.2689	12.9746
18	15.9931	15.7634	15.5319	15.2931	15.0411	14.7754	14.4961	14.2021	13.8971	13.5865
19	16.7325	16.4867	16.2394	15.9849	15.7173	15.4363	15.1409	14.8303	14.5090	14.1824
20	17.4559	17.1942	16.9312	16.6612	16.3782	16.0811	15.7691	15.4422	15.1049	14.7628
21	18.1634	17.8860	17.6075	17.3220	17.0230	16.7093	16.3810	16.0382	15.6853	15.3278
22	18.8552	18.5623	18.2683	17.9668	17.6512	17.3212	16.9770	16.6185	16.2503	15.8771
23	19.5314	19.2231	18.9131	18.5950	18.2631	17.9172	17.5573	17.1835	16.7996	16.4105
24	20.1923	19.8679	19.5413	19.2070	18.8591	18.4975	18.1223	17.7328	17.3330	16.9277
25	20.8371	20.4962	20.1533	19.8029	19.4394	19.0625	18.6716	18.2662	17.8502	17.4286
30	23.8185	23.3987	22.9772	22.5482	22.1052	21.6485	21.1780	20.6936	20.1998	19.7024
35	26.4045	25.9051	25.4046	24.8978	24.3790	23.8482	23.3057	22.7515	22.1902	21.6275
40	28.6042	28.0327	27.4625	26.8882	26.3041	25.7102	25.1066	24.4933	23.8749	23.2569
45	30.4662	29.8336	29.2043	28.5729	27.9336	27.2862	26.6309	25.9677	25.3009	24.6362
50	32.0422	31.3580	30.6787	29.9989	29.3128	28.6202	27.9211	27.2156	26.5079	25.8036

(Column group heading: Beneficial Occupancy Date)

Notes:

<1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.

<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).

<3> Region 1: ME, NH, VT, MA, CT, RI, NY, NJ, PA

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Table E-3-RO-1. Present Worth Factors--Residual Oil

Beneficial Occupancy Date

Number of Payments	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9975	1.0159	1.0301	1.0403	1.0495	1.0589	1.0684	1.0723	1.0687	1.0596
2	2.0134	2.0460	2.0704	2.0898	2.1083	2.1273	2.1407	2.1410	2.1283	2.1040
3	3.0435	3.0863	3.1199	3.1486	3.1767	3.1995	3.2094	3.2005	3.1727	3.1308
4	4.0838	4.1358	4.1787	4.2170	4.2490	4.2682	4.2689	4.2450	4.1995	4.1390
5	5.1333	5.1946	5.2472	5.2893	5.3177	5.3278	5.3134	5.2718	5.2077	5.1275
6	6.1921	6.2631	6.3194	6.3580	6.3773	6.3722	6.3402	6.2800	6.1962	6.0955
7	7.2606	7.3353	7.3881	7.4176	7.4217	7.3991	7.3484	7.2685	7.1642	7.0423
8	8.3328	8.4040	8.4477	8.4620	8.4486	8.4073	8.3369	8.2365	8.1110	7.9688
9	9.4015	9.4636	9.4921	9.4888	9.4568	9.3958	9.3049	9.1832	9.0375	8.8755
10	10.4611	10.5080	10.5190	10.4970	10.4453	10.3638	10.2517	10.1097	9.9442	9.7628
11	11.5055	11.5349	11.5272	11.4856	11.4133	11.3105	11.1781	11.0164	10.8315	10.6309
12	12.5324	12.5431	12.5157	12.4535	12.3600	12.2370	12.0848	11.9038	11.6997	11.4801
13	13.5406	13.5316	13.4837	13.4003	13.2865	13.1437	12.9722	12.7719	12.5488	12.3103
14	14.5291	14.4996	14.4304	14.3268	14.1932	14.0310	13.8403	13.6210	13.3790	13.1219
15	15.4971	15.4463	15.3569	15.2335	15.0805	14.8992	14.6895	14.4513	14.1906	13.9150
16	16.4438	16.3728	16.2636	16.1208	15.9487	15.7483	15.5197	15.2629	14.9837	14.6889
17	17.3703	17.2795	17.1509	16.9890	16.7978	16.5786	16.3313	16.0560	15.7576	15.4429
18	18.2770	18.1668	18.0191	17.8381	17.6280	17.3901	17.1244	16.8299	16.5116	16.1773
19	19.1643	19.0350	18.8682	18.6683	18.4396	18.1833	17.8983	17.5838	17.2460	16.8925
20	20.0325	19.8841	19.6985	19.4799	19.2328	18.9572	18.6523	18.3182	17.9612	17.5890
21	20.8816	20.7143	20.5100	20.2731	20.0066	19.7111	19.3867	19.0335	18.6577	18.2671
22	21.7118	21.5259	21.3032	21.0469	20.7606	20.4455	20.1019	19.7300	19.3358	18.9263
23	22.5234	22.3191	22.0771	21.8009	21.4950	21.1607	20.7984	20.4080	19.9951	19.5665
24	23.3166	23.0930	22.8310	22.5353	22.2102	21.8572	21.4765	21.0673	20.6352	20.1872
25	24.0904	23.8469	23.5654	23.2505	22.9067	22.5353	22.1357	21.7075	21.2559	20.7884
30	27.6686	27.3304	26.9546	26.5453	26.1062	25.6389	25.1438	24.6207	24.0759	23.5173
35	30.7722	30.3385	29.8679	29.3652	28.8350	28.2790	27.6973	27.0905	26.4646	25.8277
40	33.4122	32.8920	32.3376	31.7539	31.1454	30.5136	29.8587	29.1810	28.4865	27.7833
45	35.6469	35.0533	34.4281	33.7759	33.1011	32.4051	31.6881	30.9504	30.1980	29.4386
50	37.5384	36.8828	36.1976	35.4873	34.7563	34.0061	33.2366	32.4481	31.6466	30.8397

Notes: <1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.
<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).
<3> Region 1: ME, NH, VT, MA, CT, RI, NY, NJ, PA

Table E-3-NG-1. Present Worth Factors--Natural Gas

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9811	0.9620	0.9441	0.9250	0.9129	0.9097	0.9118	0.9124	0.9133	0.9120
2	1.9431	1.9061	1.8692	1.8380	1.8226	1.8215	1.8242	1.8257	1.8252	1.8190
3	2.8872	2.8311	2.7821	2.7477	2.7344	2.7339	2.7375	2.7376	2.7323	2.7202
4	3.8122	3.7441	3.6918	3.6595	3.6468	3.6472	3.6495	3.6447	3.6335	3.6111
5	4.7251	4.6537	4.6036	4.5719	4.5601	4.5591	4.5565	4.5459	4.5244	4.4890
6	5.6348	5.5656	5.5160	5.4851	5.4721	5.4662	5.4577	5.4368	5.4023	5.3556
7	6.5466	6.4780	6.4293	6.3971	6.3791	6.3674	6.3486	6.3147	6.2689	6.2162
8	7.4590	7.3912	7.3412	7.3042	7.2803	7.2583	7.2265	7.1813	7.1294	7.0748
9	8.3723	8.3032	8.2483	8.2054	8.1712	8.1362	8.0931	8.0418	7.9881	7.9227
10	9.2843	9.2103	9.1495	9.0962	9.0491	9.0028	8.9537	8.9005	8.8360	8.7526
11	10.1913	10.1114	10.0403	9.9741	9.9157	9.8633	9.8123	9.7484	9.6659	9.5645
12	11.0925	11.0023	10.9183	10.8408	10.7763	10.7220	10.6602	10.5783	10.4777	10.3586
13	11.9834	11.8802	11.7849	11.7013	11.6349	11.5699	11.4901	11.3902	11.2718	11.1350
14	12.8613	12.7469	12.6454	12.5599	12.4828	12.3998	12.3020	12.1842	12.0483	11.8940
15	13.7279	13.6074	13.5040	13.4079	13.3127	13.2116	13.0961	12.9607	12.8073	12.6357
16	14.5885	14.4660	14.3520	14.2377	14.1246	14.0057	13.8725	13.7197	13.5490	13.3595
17	15.4471	15.3140	15.1818	15.0496	14.9187	14.7822	14.6315	14.4614	14.2727	14.0646
18	16.2951	16.1438	15.9937	15.8437	15.6951	15.5412	15.3732	15.1851	14.9778	14.7514
19	17.1249	16.9557	16.7878	16.6202	16.4541	16.2829	16.0970	15.8902	15.6646	15.4203
20	17.9368	17.7498	17.5643	17.3792	17.1958	17.0066	16.8021	16.5770	16.3335	16.0716
21	18.7309	18.5263	18.3233	18.1209	17.9196	17.7117	17.4889	17.2459	16.9849	16.7058
22	19.5073	19.2850	19.0650	18.8446	18.6247	18.3985	18.1578	17.8973	17.6190	17.3223
23	20.2663	20.0270	19.7887	19.5497	19.3115	19.0674	18.8091	18.5314	18.2356	17.9210
24	21.0081	20.7507	20.4938	20.2365	19.9804	19.7188	19.4432	19.1480	18.8342	18.5015
25	21.7318	21.4558	21.1806	20.9054	20.6317	20.3529	20.0598	19.7467	19.4148	19.0637
30	25.0781	24.7136	24.3502	23.9867	23.6238	23.2554	22.8730	22.4711	22.0520	21.6158
35	27.9805	27.5267	27.0747	26.6238	26.1759	25.7244	25.2610	24.7808	24.2859	23.7765
40	30.4495	29.9147	29.3844	28.8578	28.3366	27.8142	27.2823	26.7358	26.1768	25.6053
45	32.5394	31.9360	31.3394	30.7487	30.1654	29.5831	28.9932	28.3906	27.7773	27.1534
50	34.3083	33.6469	32.9942	32.3492	31.7135	31.0804	30.4413	29.7913	29.1320	28.4637

Notes:

<1> Data Based on Assumed DOS of Apr 1993.
   Authorized Period of Use of Table is Oct 1992 through Sep 1993.

<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
   of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
   Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
   for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).

<3> Region 1: ME, NH, VT, MA, CT, RI, NY, NJ, PA

Table E-3-SC-1. Present Worth Factors--Steam Coal

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9759	0.9577	0.9369	0.9111	0.8884	0.8684	0.8531	0.8357	0.8120	0.7929
2	1.9336	1.8946	1.8480	1.7995	1.7567	1.7215	1.6888	1.6477	1.6048	1.5708
3	2.8705	2.8057	2.7364	2.6679	2.6099	2.5572	2.5008	2.4405	2.3827	2.3337
4	3.7817	3.6941	3.6048	3.5210	3.4456	3.3692	3.2937	3.2184	3.1457	3.0835
5	4.6700	4.5625	4.4579	4.3567	4.2576	4.1621	4.0716	3.9814	3.8955	3.8217
6	5.5384	5.4156	5.2936	5.1687	5.0504	4.9400	4.8345	4.7312	4.6337	4.5466
7	6.3915	6.2513	6.1056	5.9615	5.8283	5.7029	5.5843	5.4694	5.3585	5.2563
8	7.2272	7.0633	6.8984	6.7394	6.5913	6.4527	6.3226	6.1942	6.0683	5.9541
9	8.0392	7.8562	7.6763	7.5024	7.3411	7.1909	7.0474	6.9040	6.7660	6.6390
10	8.8321	8.6341	8.4393	8.2522	8.0793	7.9158	7.7571	7.6017	7.4510	7.3075
11	9.6100	9.3970	9.1891	8.9904	8.8041	8.6255	8.4549	8.2867	8.1194	7.9599
12	10.3729	10.1468	9.9273	9.7152	9.5138	9.3233	9.1398	8.9551	8.7718	8.5966
13	11.1227	10.8850	10.6521	10.4250	10.2116	10.0082	9.8083	9.6075	9.4086	9.2180
14	11.8610	11.6099	11.3619	11.1227	10.8966	10.6767	10.4607	10.2443	10.0300	9.8245
15	12.5858	12.3196	12.0596	11.8077	11.5650	11.3291	11.0974	10.8657	10.6365	10.4164
16	13.2955	13.0174	12.7446	12.4761	12.2174	11.9658	11.7188	11.4722	11.2284	10.9941
17	13.9933	13.7023	13.4130	13.1285	12.8542	12.5872	12.3253	12.0641	11.8060	11.5578
18	14.6782	14.3708	14.0654	13.7653	13.4756	13.1937	12.9172	12.6417	12.3698	12.1081
19	15.3467	15.0232	14.7022	14.3867	14.0820	13.7856	13.4949	13.2055	12.9201	12.6451
20	15.9991	15.6599	15.3236	14.9932	14.6739	14.3633	14.0587	13.7558	13.4571	13.1692
21	16.6358	16.2813	15.9301	15.5851	15.2516	14.9270	14.6089	14.2928	13.9812	13.6807
22	17.2572	16.8878	16.5220	16.1627	15.8154	15.4773	15.1459	14.8169	14.4927	14.1799
23	17.8637	17.4797	17.0996	16.7265	16.3656	16.0143	15.6700	15.3284	14.9919	14.6671
24	18.4556	18.0574	17.6634	17.2767	16.9026	16.5384	16.1815	15.8276	15.4791	15.1426
25	19.0333	18.6211	18.2137	17.8138	17.4267	17.0499	16.6807	16.3148	15.9546	15.6066
30	21.7199	21.2432	20.7727	20.3112	19.8642	19.4287	19.0024	18.5806	18.1660	17.7649
35	24.0988	23.5649	23.0385	22.5226	22.0224	21.5351	21.0581	20.5869	20.1240	19.6759
40	26.2051	25.6206	25.0448	24.4807	23.9335	23.4002	22.8784	22.3634	21.8578	21.3680
45	28.0702	27.4408	26.8213	26.2145	25.6256	25.0516	24.4901	23.9364	23.3930	22.8663
50	29.7216	29.0526	28.3943	27.7497	27.1238	26.5139	25.9172	25.3292	24.7523	24.1929

Notes: <1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.

<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).

<3> Region 1: ME, NH, VT, MA, CT, RI, NY, NJ, PA

Table E-3-LP-1. Present Worth Factors--Liquified Petroleum Gas (LPG)

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9620	0.9279	0.9028	0.8875	0.8728	0.8585	0.8452	0.8299	0.8124	0.7935
2	1.8898	1.8307	1.7903	1.7603	1.7313	1.7037	1.6751	1.6423	1.6059	1.5669
3	2.7926	2.7181	2.6631	2.6188	2.5765	2.5336	2.4875	2.4358	2.3793	2.3200
4	3.6801	3.5909	3.5216	3.4640	3.4064	3.3460	3.2810	3.2092	3.1324	3.0527
5	4.5529	4.4495	4.3668	4.2939	4.2188	4.1395	4.0544	3.9624	3.8652	3.7650
6	5.4114	5.2946	5.1967	5.1063	5.0123	4.9130	4.8075	4.6951	4.5774	4.4573
7	6.2566	6.1245	6.0091	5.8998	5.7857	5.6661	5.5402	5.4073	5.2697	5.1301
8	7.0865	6.9370	6.8026	6.6732	6.5388	6.3988	6.2525	6.0996	5.9425	5.7834
9	7.8989	7.7305	7.5760	7.4263	7.2716	7.1110	6.9448	6.7724	6.5958	6.4201
10	8.6924	8.5039	8.3291	8.1590	7.9838	7.8033	7.6176	7.4257	7.2325	7.0432
11	9.4658	9.2570	9.0619	8.8713	8.6761	8.4761	8.2709	8.0624	7.8556	7.6528
12	10.2190	9.9897	9.7741	9.5636	9.3489	9.1294	8.9076	8.6855	8.4652	8.2491
13	10.9517	10.7020	10.4664	10.2364	10.0022	9.7661	9.5307	9.2951	9.0615	8.8321
14	11.6639	11.3942	11.1392	10.8897	10.6389	10.3892	10.1403	9.8914	9.6445	9.4020
15	12.3562	12.0670	11.7925	11.5264	11.2620	10.9988	10.7366	10.4744	10.2144	9.9589
16	13.0290	12.7203	12.4292	12.1495	11.8716	11.5951	11.3196	11.0443	10.7713	10.5024
17	13.6823	13.3570	13.0523	12.7591	12.4679	12.1781	11.8895	11.6013	11.3148	11.0318
18	14.3190	13.9801	13.6619	13.3554	13.0509	12.7480	12.4464	12.1447	11.8442	11.5475
19	14.9421	14.5898	14.2582	13.9384	13.6208	13.3050	12.9899	12.6741	12.3599	12.0497
20	15.5517	15.1860	14.8412	14.5083	14.1777	13.8484	13.5193	13.1898	12.8622	12.5388
21	16.1480	15.7690	15.4111	15.0652	14.7212	14.3778	14.0350	13.6921	13.3512	13.0150
22	16.7310	16.3389	15.9680	15.6087	15.2506	14.8935	14.5372	14.1811	13.8274	13.4779
23	17.3009	16.8959	16.5115	16.1381	15.7663	15.3958	15.0263	14.6573	14.2903	13.9275
24	17.8579	17.4393	17.0409	16.6538	16.2686	15.8849	15.5025	15.1203	14.7399	14.3634
25	18.4013	17.9687	17.5566	17.1560	16.7576	16.3610	15.9654	15.5698	15.1758	14.7855
30	20.9139	20.4149	19.9366	19.4697	19.0043	18.5404	18.0778	17.6155	17.1560	16.7018
35	23.0933	22.5272	21.9823	21.4498	20.9206	20.3943	19.8708	19.3498	18.8334	18.3242
40	24.9472	24.3203	23.7166	23.1273	22.5430	21.9635	21.3886	20.8178	20.2532	19.6974
45	26.5163	25.8380	25.1845	24.5471	23.9162	23.2917	22.6732	22.0603	21.4549	20.8598
50	27.8446	27.1227	26.4270	25.7488	25.0786	24.4159	23.7606	23.1120	22.4722	21.8436

Notes: <1> Data Based on Assumed DOS of Apr 1993.
               Authorized Period of Use of Table is Oct 1992 through Sep 1993.
        <2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
               of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
               Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
               for Residential Sector (NIST Annual Supplement to Handbook 135, Oct 1992).
        <3> Region 1: ME, NH, VT, MA, CT, RI, NY, NJ, PA

Table E-3-EL-2. Present Worth Factors--Electricity

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9564	0.9202	0.8881	0.8474	0.8088	0.7803	0.7556	0.7331	0.7078	0.6835
2	1.8767	1.8084	1.7355	1.6561	1.5891	1.5359	1.4887	1.4409	1.3912	1.3465
3	2.7648	2.6557	2.5442	2.4364	2.3447	2.2690	2.1965	2.1243	2.0542	1.9903
4	3.6121	3.4645	3.3245	3.1920	3.0778	2.9768	2.8799	2.7874	2.6980	2.6133
5	4.4209	4.2448	4.0801	3.9251	3.7855	3.6602	3.5430	3.4311	3.3210	3.2145
6	5.2012	5.0004	4.8133	4.6329	4.4690	4.3233	4.1867	4.0542	3.9222	3.7944
7	5.9568	5.7335	5.5210	5.3164	5.1320	4.9670	4.8098	4.6554	4.5021	4.3533
8	6.6899	6.4413	6.2045	5.9794	5.7758	5.5901	5.4110	5.2353	5.0610	4.8932
9	7.3977	7.1247	6.8675	6.6232	6.3988	6.1912	5.9909	5.7941	5.6009	5.4161
10	8.0811	7.7877	7.5113	7.2462	7.0000	6.7712	6.5497	6.3341	6.1238	5.9220
11	8.7441	8.4315	8.1343	7.8474	7.5799	7.3300	7.0897	6.8570	6.6297	6.4114
12	9.3879	9.0545	8.7355	8.4273	8.1388	7.8700	7.6126	7.3628	7.1191	6.8848
13	10.0109	9.6557	9.3154	8.9861	8.6787	8.3929	8.1184	7.8522	7.5926	7.3430
14	10.6121	10.2356	9.8743	9.5261	9.2016	8.8987	8.6078	8.3257	8.0507	7.7862
15	11.1920	10.7945	10.4142	10.0490	9.7075	9.3881	9.0813	8.7838	8.4939	8.2151
16	11.7509	11.3344	10.9371	10.5549	10.1969	9.8616	9.5394	9.2271	8.9228	8.6299
17	12.2908	11.8573	11.4430	11.0443	10.6704	10.3197	9.9827	9.6559	9.3377	9.0312
18	12.8137	12.3632	11.9324	11.5177	11.1285	10.7630	10.4115	10.0708	9.7390	9.4194
19	13.3196	12.8526	12.4059	11.9759	11.5717	11.1918	10.8264	10.4721	10.1271	9.7948
20	13.8090	13.3261	12.8640	12.4191	12.0006	11.6067	11.2277	10.8603	10.5026	10.1580
21	14.2825	13.7842	13.3072	12.8480	12.4155	12.0080	11.6159	11.2357	10.8658	10.5093
22	14.7406	14.2274	13.7361	13.2628	12.8168	12.3961	11.9913	11.5989	11.2171	10.8492
23	15.1839	14.6563	14.1510	13.6641	13.2049	12.7716	12.3545	11.9502	11.5569	11.1778
24	15.6127	15.0712	14.5522	14.0523	13.5804	13.1348	12.7058	12.2900	11.8855	11.4955
25	16.0276	15.4725	14.9404	14.4277	13.9435	13.4861	13.0456	12.6187	12.2033	11.8027
30	17.9070	17.2904	16.6988	16.1284	15.5882	15.0764	14.5833	14.1052	13.6404	13.1921
35	19.4973	18.8280	18.1854	17.5656	16.9776	16.4196	15.8817	15.3605	14.8539	14.3651
40	20.8405	20.1265	19.4406	18.7790	18.1506	17.5536	16.9779	16.4202	15.8783	15.3554
45	21.9744	21.2227	20.5003	19.8034	19.1409	18.5109	17.9034	17.3148	16.7431	16.1914
50	22.9318	22.1481	21.3949	20.6683	19.9770	19.3191	18.6847	18.0701	17.4733	16.8973

Notes:

<1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.

<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).

<3> Region 2: OH, IN, IL, MI, WI, MN, IA, MO, ND, SD, NE, KS

Table E-3-DO-2. Present Worth Factors--Distillate Oil

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9694	0.9557	0.9481	0.9466	0.9456	0.9448	0.9443	0.9395	0.9293	0.9157
2	1.9251	1.9038	1.8946	1.8922	1.8904	1.8891	1.8838	1.8687	1.8450	1.8148
3	2.8732	2.8504	2.8402	2.8370	2.8347	2.8286	2.8130	2.7844	2.7441	2.6960
4	3.8197	3.7960	3.7850	3.7812	3.7741	3.7578	3.7287	3.6836	3.6253	3.5581
5	4.7653	4.7408	4.7293	4.7207	4.7034	4.6735	4.6279	4.5648	4.4874	4.4000
6	5.7101	5.6850	5.6688	5.6500	5.6191	5.5727	5.5090	5.4268	5.3293	5.2221
7	6.6544	6.6245	6.5980	6.5657	6.5182	6.4538	6.3711	6.2688	6.1514	6.0246
8	7.5939	7.5538	7.5137	7.4648	7.3994	7.3159	7.2130	7.0908	6.9539	6.8067
9	8.5231	8.4695	8.4129	8.3460	8.2615	8.1579	8.0351	7.8933	7.7360	7.5701
10	9.4388	9.3686	9.2941	9.2081	9.1034	8.9799	8.8376	8.6755	8.4994	8.3172
11	10.3380	10.2498	10.1561	10.0500	9.9255	9.7824	9.6198	9.4389	9.2465	9.0482
12	11.2192	11.1119	10.9981	10.8721	10.7280	10.5646	10.3832	10.1860	9.9775	9.7631
13	12.0812	11.9538	11.8201	11.6746	11.5101	11.3280	11.1303	10.9169	10.6924	10.4621
14	12.9232	12.7759	12.6226	12.4567	12.2735	12.0751	11.8612	11.6318	11.3914	11.1454
15	13.7452	13.5784	13.4048	13.2201	13.0206	12.8060	12.5761	12.3309	12.0747	11.8132
16	14.5477	14.3605	14.1682	13.9672	13.7516	13.5209	13.2751	13.0142	12.7425	12.4648
17	15.3299	15.1239	14.9153	14.6982	14.4665	14.2199	13.9585	13.6820	13.3941	13.0996
18	16.0933	15.8710	15.6462	15.4131	15.1655	14.9033	14.6262	14.3335	14.0289	13.7179
19	16.8404	16.6020	16.3611	16.1121	15.8488	15.5710	15.2778	14.9683	14.6472	14.3201
20	17.5713	17.3169	17.0602	16.7954	16.5166	16.2226	15.9126	15.5866	15.2494	14.9065
21	18.2862	18.0159	17.7435	17.4632	17.1682	16.8574	16.5309	16.1889	15.8358	15.4774
22	18.9853	18.6992	18.4113	18.1148	17.8030	17.4757	17.1331	16.7752	16.4067	16.0325
23	19.6686	19.3670	19.0628	18.7496	18.4213	18.0779	17.7195	17.3462	16.9618	16.5715
24	20.3364	20.0186	19.6976	19.3679	19.0235	18.6643	18.2905	17.9013	17.5008	17.0941
25	20.9879	20.6534	20.3159	19.9701	19.6099	19.2353	18.8455	18.4402	18.0234	17.6003
30	24.0006	23.5863	23.1695	22.7441	22.3037	21.8483	21.3782	20.8931	20.3977	19.8979
35	26.6136	26.1190	25.6223	25.1184	24.6013	24.0711	23.5281	22.9725	22.4089	21.8431
40	28.8364	28.2689	27.7018	27.1296	26.5465	25.9526	25.3479	24.7325	24.1112	23.4897
45	30.7179	30.0886	29.4618	28.8319	28.1931	27.5451	26.8882	26.2223	25.5521	24.8833
50	32.3104	31.6289	30.9516	30.2729	29.5867	28.8931	28.1919	27.4833	26.7718	26.0630

Notes: <1> Data Based on Assumed DOS of Apr 1993.
            Authorized Period of Use of Table is Oct 1992 through Sep 1993.
        <2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
            of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
            Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
            for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).
        <3> Region 2: OH, IN, IL, MI, WI, MN, IA, MO, ND, SD, NE, KS

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Table E-3-RO-2. Present Worth Factors--Residual Oil

Beneficial Occupancy Date

Number of Payments	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	1.0049	1.0367	1.0614	1.0791	1.0986	1.1166	1.1344	1.1453	1.1454	1.1400
2	2.0416	2.0980	2.1405	2.1777	2.2153	2.2510	2.2797	2.2907	2.2854	2.2684
3	3.1030	3.1771	3.2391	3.2944	3.3497	3.3963	3.4251	3.4307	3.4138	3.3819
4	4.1821	4.2758	4.3557	4.4288	4.4949	4.5417	4.5651	4.5590	4.5273	4.4778
5	5.2807	5.3924	5.4901	5.5740	5.6403	5.6817	5.6934	5.6726	5.6232	5.5535
6	6.3973	6.5268	6.6354	6.7194	6.7803	6.8101	6.8070	6.7684	6.6989	6.6091
7	7.5317	7.6721	7.7808	7.8594	7.9087	7.9236	7.9029	7.8442	7.7545	7.6443
8	8.6770	8.8175	8.9208	8.9878	9.0222	9.0195	8.9786	8.8997	8.7897	8.6593
9	9.8224	9.9575	10.0492	10.1013	10.1181	10.0952	10.0341	9.9350	9.8048	9.6536
10	10.9624	11.0858	11.1627	11.1972	11.1939	11.1508	11.0694	10.9500	10.7990	10.6266
11	12.0908	12.1994	12.2586	12.2730	12.2494	12.1860	12.0844	11.9442	11.7720	11.5786
12	13.2043	13.2952	13.3343	13.3285	13.2847	13.2010	13.0786	12.9172	12.7240	12.5096
13	14.3002	14.3710	14.3899	14.3638	14.2997	14.1953	14.0517	13.8692	13.6550	13.4200
14	15.3759	15.4265	15.4251	15.3788	15.2939	15.1683	15.0036	14.8003	14.5654	14.3100
15	16.4315	16.4618	16.4402	16.3730	16.2669	16.1202	15.9347	15.7107	15.4554	15.1797
16	17.4667	17.4768	17.4344	17.3460	17.2189	17.0513	16.8451	16.6006	16.3251	16.0283
17	18.4817	18.4710	18.4074	18.2980	18.1500	17.9617	17.7350	17.4703	17.1737	16.8550
18	19.4760	19.4440	19.3594	19.2291	19.0604	18.8517	18.6047	18.3189	18.0004	17.6603
19	20.4490	20.3960	20.2904	20.1395	19.9503	19.7214	19.4533	19.1457	18.8057	18.4446
20	21.4009	21.3271	21.2008	21.0294	20.8200	20.5700	20.2801	19.9510	19.5900	19.2083
21	22.3320	22.2375	22.0908	21.8991	21.6686	21.3967	21.0854	20.7352	20.3537	19.9518
22	23.2424	23.1274	22.9605	22.7477	22.4953	22.2020	21.8697	21.4990	21.0973	20.6748
23	24.1324	23.9971	23.8091	23.5744	23.3006	22.9863	22.6334	22.2425	21.8202	21.3767
24	25.0021	24.8457	24.6358	24.3797	24.0849	23.7500	23.3769	22.9654	22.5221	22.0574
25	25.8507	25.6725	25.4411	25.1640	24.8486	24.4935	24.0998	23.6674	23.2028	22.7166
30	29.7742	29.4922	29.1575	28.7768	28.3570	27.8967	27.3983	26.8619	26.2950	25.7089
35	33.1774	32.7907	32.3520	31.8690	31.3493	30.7917	30.1983	29.5700	28.9143	28.2424
40	36.0724	35.5907	35.0602	34.4884	33.8827	33.2420	32.5683	31.8623	31.1314	30.3868
45	38.5227	37.9607	37.3525	36.7055	36.0271	35.3161	34.5744	33.8026	33.0081	32.2019
50	40.5968	39.9668	39.2927	38.5821	37.8422	37.0717	36.2724	35.4449	34.5965	33.7382

Notes: <1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.
<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).
<3> Region 2: OH, IN, IL, MI, WI, MN, IA, MO, ND, SD, NE, KS

Table E-3-NG-2. Present Worth Factors--Natural Gas

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9828	0.9640	0.9465	0.9288	0.9186	0.9168	0.9208	0.9232	0.9249	0.9251
2	1.9468	1.9105	1.8753	1.8474	1.8354	1.8376	1.8440	1.8481	1.8500	1.8466
3	2.8933	2.8393	2.7939	2.7642	2.7562	2.7608	2.7689	2.7732	2.7715	2.7633
4	3.8221	3.7579	3.7107	3.6850	3.6794	3.6857	3.6941	3.6947	3.6882	3.6712
5	4.7407	4.6747	4.6316	4.6082	4.6043	4.6109	4.6155	4.6114	4.5961	4.5665
6	5.6575	5.5956	5.5548	5.5331	5.5294	5.5324	5.5322	5.5193	5.4914	5.4511
7	6.5783	6.5188	6.4796	6.4583	6.4509	6.4490	6.4401	6.4146	6.3760	6.3312
8	7.5015	7.4437	7.4048	7.3798	7.3676	7.3569	7.3355	7.2992	7.2561	7.2100
9	8.4264	8.3688	8.3263	8.2964	8.2755	8.2523	8.2200	8.1793	8.1349	8.0775
10	9.3515	9.2903	9.2430	9.2043	9.1708	9.1368	9.1001	9.0581	9.0024	8.9265
11	10.2730	10.2070	10.1509	10.0997	10.0554	10.0170	9.9790	9.9256	9.8514	9.7571
12	11.1897	11.1149	11.0462	10.9842	10.9355	10.8958	10.8465	10.7746	10.6820	10.5695
13	12.0976	12.0102	11.9308	11.8644	11.8143	11.7633	11.6954	11.6052	11.4944	11.3639
14	12.9929	12.8948	12.8109	12.7432	12.6818	12.6122	12.5260	12.4176	12.2888	12.1404
15	13.8775	13.7749	13.6897	13.6107	13.5308	13.4429	13.3384	13.2120	13.0653	12.8992
16	14.7576	14.6537	14.5572	14.4596	14.3614	14.2553	14.1328	13.9885	13.8241	13.6396
17	15.6364	15.5212	15.4062	15.2903	15.1738	15.0496	14.9093	14.7473	14.5645	14.3610
18	16.5039	16.3702	16.2368	16.1027	15.9682	15.8261	15.6681	15.4877	15.2859	15.0636
19	17.3529	17.2008	17.0492	16.8970	16.7447	16.5849	16.4086	16.2091	15.9885	15.7479
20	18.1835	18.0132	17.8435	17.6735	17.5035	17.3254	17.1299	16.9117	16.6728	16.4143
21	18.9959	18.8075	18.6200	18.4323	18.2439	18.0467	17.8325	17.5960	17.3392	17.0631
22	19.7903	19.5840	19.3789	19.1728	18.9653	18.7494	18.5169	18.2624	17.9880	17.6938
23	20.5668	20.3429	20.1193	19.8941	19.6679	19.4337	19.1832	18.9111	18.6187	18.3063
24	21.3256	21.0833	20.8406	20.5968	20.3522	20.1000	19.8320	19.5419	19.2312	18.9002
25	22.0660	21.8046	21.5433	21.2811	21.0186	20.7488	20.4628	20.1544	19.8251	19.4754
30	25.4895	25.1375	24.7859	24.4333	24.0797	23.7182	23.3408	22.9417	22.5231	22.0863
35	28.4588	28.0155	27.5732	27.1314	26.6906	26.2441	25.7839	25.3046	24.8086	24.2968
40	30.9848	30.4586	29.9362	29.4168	28.9011	28.3821	27.8518	27.3047	26.7431	26.1678
45	33.1228	32.5265	31.9363	31.3513	30.7722	30.1918	29.6021	28.9977	28.3805	27.7516
50	34.9325	34.2768	33.6292	32.9887	32.3559	31.7236	31.0836	30.4306	29.7664	29.0921

Notes: <1> Data Based on Assumed DOS of Apr 1993.
             Data Based on Assumed DOS of Oct 1992 through Sep 1993.
             Authorized Period of Use of Table is Oct 1992 through Sep 1993.
        <2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
             of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
             Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
             for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).
        <3> Region 2: OH, IN, IL, MI, WI, MN, IA, MO, ND, SD, NE, KS

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Table E-3-SC-2. Present Worth Factors--Steam Coal

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9709	0.9457	0.9180	0.8855	0.8541	0.8291	0.8071	0.7880	0.7669	0.7440
2	1.9166	1.8637	1.8036	1.7397	1.6832	1.6361	1.5951	1.5548	1.5109	1.4679
3	2.8347	2.7493	2.6577	2.5687	2.4903	2.4241	2.3619	2.2988	2.2347	2.1761
4	3.7202	3.6034	3.4868	3.3758	3.2782	3.1910	3.1059	3.0227	2.9430	2.8708
5	4.5743	4.4325	4.2938	4.1638	4.0451	3.9350	3.8298	3.7310	3.6377	3.5540
6	5.4034	5.2395	5.0818	4.9306	4.7891	4.6588	4.5380	4.4257	4.3208	4.2271
7	6.2104	6.0275	5.8487	5.6746	5.5130	5.3671	5.2328	5.1088	4.9940	4.8884
8	6.9984	6.7944	6.5927	6.3985	6.2212	6.0618	5.9159	5.7820	5.6552	5.5343
9	7.7653	7.5384	7.3165	7.1067	6.9160	6.7449	6.5890	6.4432	6.3011	6.1648
10	8.5093	8.2622	8.0248	7.8015	7.5991	7.4181	7.2503	7.0891	6.9317	6.7803
11	9.2331	8.9705	8.7195	8.4846	8.2722	8.0793	7.8962	7.7197	7.5471	7.3809
12	9.9414	9.6652	9.4026	9.1578	8.9335	8.7252	8.5268	8.3351	8.1478	7.9671
13	10.6361	10.3483	10.0758	9.8190	9.5794	9.3558	9.1422	8.9358	8.7340	8.5392
14	11.3193	11.0215	10.7370	10.4649	10.2100	9.9712	9.7428	9.5219	9.3061	9.0976
15	11.9924	11.6827	11.3829	11.0955	10.8254	10.5719	10.3290	10.0941	9.8644	9.6425
16	12.6537	12.3286	12.0135	11.7109	11.4260	11.1581	10.9011	10.6524	10.4093	10.1743
17	13.2996	12.9592	12.6289	12.3115	12.0122	11.7302	11.4595	11.1973	10.9412	10.6934
18	13.9301	13.5746	13.2296	12.8977	12.5843	12.2885	12.0044	11.7292	11.4602	11.1999
19	14.5456	14.1753	13.8158	13.4698	13.1427	12.8334	12.5362	12.2482	11.9668	11.6943
20	15.1462	14.7615	14.3879	14.0282	13.6876	13.3653	13.0553	12.7548	12.4612	12.1768
21	15.7324	15.3336	14.9462	14.5731	14.2194	13.8843	13.5618	13.2492	12.9437	12.6477
22	16.3045	15.8919	15.4911	15.1049	14.7385	14.3909	14.0562	13.7317	13.4146	13.1073
23	16.8628	16.4368	16.0230	15.6240	15.2450	14.8853	14.5387	14.2026	13.8742	13.5559
24	17.4078	16.9687	16.5420	16.1306	15.7394	15.3678	15.0096	14.6622	14.3227	13.9936
25	17.9396	17.4877	17.0486	16.6250	16.2219	15.8387	15.4692	15.1107	14.7605	14.4208
30	20.4130	19.9017	19.4045	18.9242	18.4660	18.0288	17.6067	17.1968	16.7964	16.4078
35	22.6031	22.0391	21.4906	20.9602	20.4529	19.9680	19.4993	19.0439	18.5991	18.1672
40	24.5423	23.9317	23.3377	22.7629	22.2123	21.6851	21.1751	20.6794	20.1953	19.7250
45	26.2594	25.6075	24.9732	24.3591	23.7701	23.2054	22.6589	22.1275	21.6086	21.1044
50	27.7798	27.0913	26.4213	25.7724	25.1495	24.5516	23.9727	23.4098	22.8601	22.3257

Notes: <1> Data Based on Assumed DOS of Apr 1993.
        Authorized Period of Use of Table is Oct 1992 through Sep 1993.
  <2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
       of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
       Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
       for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).
  <3> Region 2: OH, IN, IL, MI, WI, MN, IA, MO, ND, SD, NE, KS

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Table E-3-LP-2. Present Worth Factors--Liquified Petroleum Gas (LPG)

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9622	0.9293	0.9089	0.9014	0.8947	0.8887	0.8828	0.8738	0.8609	0.8456
2	1.8915	1.8382	1.8102	1.7960	1.7833	1.7715	1.7566	1.7347	1.7065	1.6737
3	2.8003	2.7395	2.7049	2.6847	2.6661	2.6452	2.6175	2.5803	2.5346	2.4836
4	3.7017	3.6342	3.5936	3.5675	3.5399	3.5061	3.4631	3.4084	3.3445	3.2747
5	4.5964	4.5229	4.4764	4.4412	4.4008	4.3517	4.2912	4.2183	4.1356	4.0465
6	5.4850	5.4057	5.3501	5.3022	5.2464	5.1799	5.1011	5.0094	4.9074	4.7993
7	6.3678	6.2794	6.2110	6.1478	6.0745	5.9898	5.8922	5.7812	5.6603	5.5335
8	7.2416	7.1403	7.0566	6.9759	6.8844	6.7809	6.6640	6.5340	6.3944	6.2486
9	8.1025	7.9860	7.8848	7.7858	7.6755	7.5527	7.4168	7.2682	7.1096	6.9466
10	8.9481	8.8141	8.6947	8.5769	8.4473	8.3055	8.1510	7.9833	7.8075	7.6297
11	9.7762	9.6240	9.4858	9.3487	9.2001	9.0396	8.8661	8.6813	8.4906	8.2980
12	10.5861	10.4151	10.2576	10.1015	9.9343	9.7548	9.5641	9.3644	9.1589	8.9516
13	11.3772	11.1869	11.0104	10.8357	10.6494	10.4527	10.2472	10.0326	9.8125	9.5907
14	12.1490	11.9397	11.7445	11.5508	11.3474	11.1358	10.9154	10.6863	10.4516	10.2155
15	12.9018	12.6738	12.4597	12.2488	12.0305	11.8041	11.5691	11.3254	11.0764	10.8260
16	13.6360	13.3890	13.1576	12.9318	12.6988	12.4577	12.2082	11.9501	11.6869	11.4217
17	14.3511	14.0870	13.8407	13.6001	13.3524	13.0969	12.8329	12.5607	12.2826	12.0021
18	15.0491	14.7700	14.5090	14.2538	13.9915	13.7216	13.4435	13.1564	12.8630	12.5674
19	15.7322	15.4383	15.1626	14.8929	14.6163	14.3321	14.0392	13.7368	13.4283	13.1180
20	16.4005	16.0919	15.8018	15.5176	15.2268	14.9279	14.6196	14.3021	13.9789	13.6541
21	17.0541	16.7311	16.4265	16.1282	15.8225	15.5082	15.1849	14.8527	14.5151	14.1761
22	17.6932	17.3558	17.0370	16.7239	16.4029	16.0736	15.7355	15.3888	15.0370	14.6836
23	18.3180	17.9663	17.6328	17.3043	16.9682	16.6241	16.2716	15.9108	15.5446	15.1764
24	18.9285	18.5621	18.2131	17.8696	17.5188	17.1603	16.7936	16.4183	16.0373	15.6543
25	19.5242	19.1424	18.7785	18.4202	18.0549	17.6823	17.3011	16.9111	16.5152	16.1170
30	22.2786	21.8240	21.3874	20.9564	20.5178	20.0714	19.6167	19.1537	18.6859	18.2177
35	24.6677	24.1396	23.6300	23.1272	22.6185	22.1036	21.5823	21.0548	20.5247	19.9962
40	26.7000	26.1052	25.5312	24.9660	24.3970	23.8238	23.2461	22.6641	22.0812	21.5016
45	28.4202	27.7690	27.1404	26.5224	25.9024	25.2799	24.6544	24.0261	23.3986	22.7758
50	29.8762	29.1773	28.5025	27.8398	27.1766	26.5123	25.8464	25.1791	24.5137	23.8543

Notes: <1> Data Based on Assumed DOS of Apr 1993.
            Authorized Period of Use of Table is Oct 1992 through Sep 1993.
        <2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
            of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
            Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
            for Residential Sector (NIST Annual Supplement to Handbook 135, Oct 1992).
        <3> Region 2: OH, IN, IL, MI, WI, MN, IA, MO, ND, SD, NE, KS

Table E-3-EL-3. Present Worth Factors—Electricity

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9633	0.9356	0.9025	0.8691	0.8398	0.8144	0.7954	0.7783	0.7578	0.7372
2	1.8989	1.8381	1.7716	1.7089	1.6542	1.6097	1.5737	1.5361	1.4950	1.4539
3	2.8014	2.7072	2.6114	2.5232	2.4495	2.3881	2.3315	2.2733	2.2117	2.1515
4	3.6705	3.5470	3.4257	3.3186	3.2279	3.1459	3.0687	2.9900	2.9093	2.8284
5	4.5103	4.3614	4.2211	4.0969	3.9857	3.8831	3.7854	3.6876	3.5863	3.4831
6	5.3246	5.1568	4.9995	4.8547	4.7229	4.5997	4.4830	4.3646	4.2409	4.1166
7	6.1200	5.9351	5.7573	5.5920	5.4395	5.2974	5.1600	5.0192	4.8744	4.7290
8	6.8983	6.6929	6.4945	6.3086	6.1372	5.9743	5.8146	5.6527	5.4868	5.3220
9	7.6561	7.4301	7.2111	7.0062	6.8141	6.6290	6.4481	6.2652	6.0798	5.8962
10	8.3934	8.1467	7.9088	7.6832	7.4688	7.2625	7.0605	6.8581	6.6540	6.4517
11	9.1100	8.8444	8.5857	8.3378	8.1023	7.8749	7.6535	7.4323	7.2095	6.9892
12	9.8077	9.5213	9.2404	8.9713	8.7147	8.4679	8.2277	7.9879	7.7470	7.5091
13	10.4846	10.1760	9.8739	9.5838	9.3077	9.0421	8.7833	8.5253	8.2669	8.0122
14	11.1393	10.8095	10.4863	10.1767	9.8819	9.5976	9.3207	9.0453	8.7700	8.4990
15	11.7728	11.4219	11.0793	10.7509	10.4374	10.1351	9.8407	9.5483	9.2568	8.9699
16	12.3852	12.0149	11.6535	11.3065	10.9749	10.6550	10.3437	10.0351	9.7277	9.4255
17	12.9781	12.5891	12.2090	11.8439	11.4948	11.1581	10.8305	10.5061	10.1833	9.8662
18	13.5524	13.1446	12.7464	12.3639	11.9979	11.6448	11.3014	10.9617	10.6240	10.2924
19	14.1079	13.6821	13.2664	12.8669	12.4846	12.1158	11.7570	11.4023	11.0502	10.7047
20	14.6453	14.2020	13.7695	13.3537	12.9556	12.5714	12.1977	11.8286	11.4625	11.1036
21	15.1653	14.7051	14.2562	13.8247	13.4112	13.0121	12.6240	12.2409	11.8614	11.4894
22	15.6684	15.1918	14.7272	14.2803	13.8519	13.4383	13.0363	12.6397	12.2472	11.8626
23	16.1551	15.6628	15.1828	14.7209	14.2781	13.8506	13.4351	13.0255	12.6204	12.2234
24	16.6261	16.1184	15.6235	15.1472	14.6904	14.2495	13.8209	13.3987	12.9812	12.5724
25	17.0817	16.5591	16.0497	15.5595	15.0892	14.6353	14.1941	13.7596	13.3302	12.9097
30	19.1455	18.5554	17.9807	17.4271	16.8954	16.3817	15.8826	15.3921	14.9084	14.4355
35	20.8920	20.2440	19.6132	19.0053	18.4211	17.8567	17.3085	16.7705	16.2409	15.7236
40	22.3670	21.6699	20.9916	20.3378	19.7093	19.1020	18.5123	17.9342	17.3659	16.8111
45	23.6122	22.8737	22.1553	21.4628	20.7968	20.1532	19.5286	18.9166	18.3156	17.7292
50	24.6635	23.8900	23.1378	22.4125	21.7149	21.0408	20.3866	19.7461	19.1174	18.5043

Notes: <1> Data Based on Assumed DOS of Apr 1993.
                Authorized Period of Use of Table is Oct 1992 through Sep 1993.
     <2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
                of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
                Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
                for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).
     <3> Region 3: DE, MD, DC, VA, WV, NC, SC, GA, FL, KY, TN, AL, MS, AR, LA, OK, TX

Table E-3-DO-3. Present Worth Factors--Distillate Oil

Number of Payments	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
					Beneficial Occupancy Date					
1	0.9687	0.9550	0.9485	0.9485	0.9488	0.9494	0.9501	0.9464	0.9370	0.9240
2	1.9237	1.9036	1.8970	1.8973	1.8982	1.8995	1.8965	1.8833	1.8609	1.8318
3	2.8722	2.8521	2.8458	2.8467	2.8483	2.8459	2.8334	2.8073	2.7688	2.7221
4	3.8207	3.8009	3.7952	3.7968	3.7947	3.7828	3.7574	3.7152	3.6590	3.5935
5	4.7695	4.7502	4.7453	4.7432	4.7316	4.7068	4.6653	4.6054	4.5304	4.4449
6	5.7189	5.7004	5.6917	5.6801	5.6556	5.6146	5.5555	5.4768	5.3818	5.2766
7	6.6690	6.6467	6.6287	6.6041	6.5635	6.5049	6.4269	6.3282	6.2135	6.0894
8	7.6154	7.5837	7.5526	7.5119	7.4537	7.3763	7.2783	7.1599	7.0263	6.8819
9	8.5523	8.5077	8.4605	8.4022	8.3251	8.2277	8.1100	7.9727	7.8188	7.6550
10	9.4763	9.4155	9.3507	9.2736	9.1765	9.0594	8.9228	8.7652	8.5919	8.4116
11	10.3842	10.3058	10.2221	10.1250	10.0082	9.8722	9.7153	9.5383	9.3485	9.1518
12	11.2744	11.1772	11.0735	10.9567	10.8210	10.6647	10.4884	10.2949	10.0887	9.8758
13	12.1458	12.0286	11.9052	11.7695	11.6135	11.4378	11.2450	11.0351	10.8127	10.5837
14	12.9972	12.8603	12.7180	12.5620	12.3866	12.1944	11.9852	11.7591	11.5206	11.2757
15	13.8289	13.6731	13.5105	13.3351	13.1432	12.9346	12.7092	12.4670	12.2126	11.9519
16	14.6417	14.4656	14.2836	14.0917	13.8834	13.6586	13.4171	13.1590	12.8889	12.6117
17	15.4342	15.2387	15.0402	14.8319	14.6074	14.3665	14.1091	13.8352	13.5487	13.2546
18	16.2073	15.9952	15.7804	15.5559	15.3153	15.0585	14.7854	14.4951	14.1915	13.8808
19	16.9639	16.7355	16.5044	16.2638	16.0073	15.7347	15.4452	15.1379	14.8177	14.4906
20	17.7041	17.4594	17.2123	16.9558	16.6835	16.3946	16.0880	15.7641	15.4276	15.0845
21	18.4281	18.1673	17.9043	17.6320	17.3434	17.0374	16.7142	16.3739	16.0214	15.6626
22	19.1360	18.8593	18.5806	18.2919	17.9862	17.6636	17.3241	16.9678	16.5996	16.2247
23	19.8280	19.5356	19.2404	18.9347	18.6124	18.2734	17.9179	17.5459	17.1617	16.7706
24	20.5043	20.1954	19.8832	19.5609	19.2222	18.8673	18.4961	18.1081	17.7075	17.2998
25	21.1641	20.8383	20.5094	20.1707	19.8161	19.4454	19.0582	18.6539	18.2368	17.8124
30	24.2150	23.8084	23.3992	22.9799	22.5441	22.0917	21.6230	21.1378	20.6412	20.1392
35	26.8612	26.3732	25.8832	25.3843	24.8708	24.3427	23.8002	23.2436	22.6779	22.1091
40	29.1122	28.5504	27.9890	27.4211	26.8407	26.2480	25.6431	25.0260	24.4019	23.7765
45	31.0175	30.3933	29.7714	29.1450	28.5082	27.8608	27.2029	26.5347	25.8611	25.1879
50	32.6303	31.9531	31.2801	30.6042	29.9195	29.2258	28.5232	27.8117	27.0962	26.3825

Notes:

<1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.

<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum of Agreement on Criteria/Standards for EA/LCC for MILCON Design. Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).

<3> Region 3: DE, MD, DC, VA, WV, NC, SC, GA, FL, KY, TN, AL, MS, AR, LA, OK, TX

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Table E-3-RO-3. Present Worth Factors--Residual Oil

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	1.0028	1.0294	1.0510	1.0678	1.0846	1.1001	1.1141	1.1229	1.1230	1.1165
2	2.0322	2.0804	2.1188	2.1524	2.1848	2.2142	2.2370	2.2459	2.2395	2.2206
3	3.0832	3.1482	3.2034	3.2525	3.2989	3.3372	3.3600	3.3624	3.3436	3.3083
4	4.1509	4.2328	4.3035	4.3666	4.4218	4.4601	4.4765	4.4665	4.4313	4.3780
5	5.2356	5.3329	5.4176	5.4896	5.5448	5.5766	5.5806	5.5542	5.5010	5.4285
6	6.3357	6.4470	6.5406	6.6125	6.6613	6.6808	6.6683	6.6239	6.5515	6.4577
7	7.4498	7.5699	7.6635	7.7290	7.7654	7.7684	7.7380	7.6744	7.5807	7.4657
8	8.5727	8.6929	8.7800	8.8332	8.8530	8.8381	8.7885	8.7036	8.5886	8.4534
9	9.6957	9.8094	9.8842	9.9208	9.9228	9.8886	9.8177	9.7116	9.5764	9.4207
10	10.8122	10.9135	10.9718	10.9905	10.9733	10.9178	10.8257	10.6993	10.5437	10.3674
11	11.9163	12.0012	12.0415	12.0410	12.0025	11.9258	11.8134	11.6666	11.4904	11.2935
12	13.0040	13.0709	13.0920	13.0702	13.0104	12.9135	12.7807	12.6133	12.4165	12.1994
13	14.0737	14.1214	14.1212	14.0782	13.9982	13.8808	13.7274	13.5394	13.3224	13.0852
14	15.1242	15.1506	15.1292	15.0659	14.9655	14.8275	14.6536	14.4453	14.2081	13.9510
15	16.1534	16.1586	16.1169	16.0332	15.9121	15.7537	15.5594	15.3311	15.0740	14.7971
16	17.1613	17.1463	17.0843	16.9799	16.8383	16.6595	16.4452	16.1969	15.9201	15.6227
17	18.1491	18.1136	18.0309	17.9061	17.7442	17.5453	17.3110	17.0430	16.7457	16.4271
18	19.1164	19.0603	18.9571	18.8119	18.6299	18.4111	18.1572	17.8686	17.5501	17.2106
19	20.0631	19.9865	19.8630	19.6977	19.4958	19.2573	18.9828	18.6730	18.3336	17.9736
20	20.9892	20.8923	20.7487	20.5635	20.3419	20.0829	19.7871	19.4565	19.0966	18.7166
21	21.8951	21.7781	21.6145	21.4097	21.1675	20.8872	20.5706	20.2195	19.8396	19.4401
22	22.7808	22.6439	22.4607	22.2353	21.9719	21.6707	21.3336	20.9625	20.5630	20.1434
23	23.6467	23.4901	23.2863	23.0396	22.7553	22.4338	22.0767	21.6860	21.2664	20.8263
24	24.4928	24.3157	24.0906	23.8231	23.5184	23.1768	22.8001	22.3893	21.9493	21.4886
25	25.3184	25.1200	24.8741	24.5862	24.2614	23.9002	23.5034	23.0722	22.6116	22.1300
30	29.1357	28.8363	28.4899	28.1011	27.6747	27.2112	26.7126	26.1802	25.6200	25.0412
35	32.4468	32.0455	31.5979	31.1095	30.5860	30.0277	29.4368	28.8150	28.1684	27.5061
40	35.2633	34.7697	34.2327	33.6580	33.0508	32.4117	31.7426	31.0452	30.3255	29.5924
45	37.6473	37.0755	36.4629	35.8150	35.1372	34.4296	33.6943	32.9329	32.1512	31.3583
50	39.6652	39.0272	38.3506	37.6408	36.9031	36.1376	35.3463	34.5308	33.6967	32.8530

Notes:

<1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.

<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).

<3> Region 3: DE, MD, DC, VA, WV, NC, SC, GA, FL, KY, TN, AL, MS, AR, LA, OK, TX

Table E-3-NG-3. Present Worth Factors--Natural Gas

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9946	0.9859	0.9785	0.9682	0.9689	0.9837	1.0069	1.0255	1.0425	1.0581
2	1.9805	1.9644	1.9467	1.9371	1.9526	1.9906	2.0325	2.0680	2.1005	2.1238
3	2.9590	2.9326	2.9156	2.9208	2.9595	3.0162	3.0750	3.1261	3.1663	3.1949
4	3.9272	3.9015	3.8993	3.9277	3.9850	4.0587	4.1330	4.1918	4.2374	4.2648
5	4.8961	4.8852	4.9062	4.9533	5.0275	5.1167	5.1988	5.2629	5.3073	5.3283
6	5.8798	5.8921	5.9317	5.9957	6.0856	6.1825	6.2699	6.3328	6.3708	6.3877
7	6.8867	6.9176	6.9742	7.0538	7.1513	7.2536	7.3398	7.3963	7.4302	7.4501
8	7.9122	7.9601	8.0323	8.1196	8.2225	8.3235	8.4033	8.4557	8.4926	8.5213
9	8.9547	9.0182	9.0980	9.1907	9.2923	9.3870	9.4627	9.5181	9.5637	9.5836
10	10.0128	10.0839	10.1692	10.2606	10.3558	10.4464	10.5251	10.5893	10.6261	10.6234
11	11.0785	11.1550	11.2390	11.3240	11.4152	11.5088	11.5962	11.6517	11.6659	11.6406
12	12.1497	12.2249	12.3025	12.3834	12.4776	12.5799	12.6586	12.6914	12.6831	12.6355
13	13.2195	13.2884	13.3619	13.4459	13.5488	13.6423	13.6983	13.7086	13.6780	13.6083
14	14.2830	14.3478	14.4243	14.5170	14.6112	14.6820	14.7156	14.7035	14.6508	14.5593
15	15.3424	15.4102	15.4955	15.5794	15.6509	15.6993	15.7105	15.6763	15.6018	15.4886
16	16.4048	16.4814	16.5579	16.6191	16.6681	16.6942	16.6833	16.6273	16.5311	16.3954
17	17.4760	17.5438	17.5976	17.6363	17.6630	17.6670	17.6342	17.5566	17.4379	17.2788
18	18.5384	18.5835	18.6148	18.6313	18.6359	18.6179	18.5636	18.4634	18.3213	18.1393
19	19.5781	19.6007	19.6097	19.6041	19.5868	19.5473	19.4703	19.3468	19.1818	18.9774
20	20.5953	20.5956	20.5826	20.5550	20.5161	20.4540	20.3538	20.2073	20.0199	19.7935
21	21.5902	21.5684	21.5335	21.4844	21.4229	21.3375	21.2143	21.0454	20.8359	20.5880
22	22.5631	22.5194	22.4628	22.3911	22.3063	22.1980	22.0523	21.8615	21.6305	21.3605
23	23.5140	23.4487	23.3696	23.2745	23.1668	23.0360	22.8684	22.6560	22.4030	22.1105
24	24.4433	24.3555	24.2530	24.1351	24.0049	23.8521	23.6629	23.4285	23.1530	22.8379
25	25.3501	25.2389	25.1135	24.9731	24.8210	24.6466	24.4354	24.1785	23.8804	23.5423
30	29.5427	29.3206	29.0848	28.8336	28.5698	28.2832	27.9601	27.5921	27.1845	26.7398
35	33.1792	32.8452	32.4983	32.1378	31.7673	31.3766	30.9520	30.4859	29.9835	29.4469
40	36.2726	35.8372	35.3921	34.9367	34.4745	33.9949	33.4845	32.9354	32.3526	31.7384
45	38.8910	38.3697	37.8416	37.3059	36.7659	36.2112	35.6281	35.0086	34.3579	33.6779
50	41.1073	40.5133	39.9149	39.3111	38.7054	38.0871	37.4425	36.7635	36.0552	35.3196

Notes: <1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.
<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).
<3> Region 3: DE, MD, DC, VA, WV, NC, SC, GA, FL, KY, TN, AL, MS, AR, LA, OK, TX

Table E-3-SC-3. Present Worth Factors--Steam Coal

Beneficial Occupancy Date

Number of Payments	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9781	0.9591	0.9400	0.9211	0.9022	0.8857	0.8734	0.8588	0.8358	0.8134
2	1.9371	1.8991	1.8612	1.8233	1.7879	1.7591	1.7321	1.6946	1.6492	1.6104
3	2.8772	2.8202	2.7634	2.7090	2.6612	2.6178	2.5680	2.5080	2.4462	2.3947
4	3.7983	3.7224	3.6490	3.5824	3.5200	3.4537	3.3814	3.3050	3.2305	3.1661
5	4.7005	4.6081	4.5224	4.4411	4.3558	4.2670	4.1784	4.0893	4.0019	3.9211
6	5.5862	5.4815	5.3812	5.2770	5.1692	5.0640	4.9627	4.8607	4.7569	4.6614
7	6.4596	6.3402	6.2170	6.0903	5.9662	5.8483	5.7341	5.6157	5.4972	5.3901
8	7.3183	7.1761	7.0304	6.8873	6.7505	6.6197	6.4891	6.3560	6.2260	6.1070
9	8.1542	7.9895	7.8274	7.6716	7.5219	7.3748	7.2294	7.0847	6.9429	6.8102
10	8.9675	8.7865	8.6117	8.4430	8.2770	8.1151	7.9581	7.8016	7.6460	7.4964
11	9.7645	9.5708	9.3831	9.1981	9.0173	8.8438	8.6750	8.5048	8.3322	8.1661
12	10.5488	10.3422	10.1381	9.9384	9.7460	9.5607	9.3781	9.1910	9.0019	8.8197
13	11.3202	11.0972	10.8784	10.6671	10.4629	10.2638	10.0644	9.8607	9.6555	9.4576
14	12.0753	11.8375	11.6071	11.3840	11.1660	10.9500	10.7341	10.5143	10.2935	10.0802
15	12.8156	12.5662	12.3240	12.0871	11.8522	11.6197	11.3877	11.1522	10.9160	10.6878
16	13.5443	13.2831	13.0272	12.7733	12.5219	12.2734	12.0256	11.7748	11.5236	11.2808
17	14.2612	13.9862	13.7134	13.4430	13.1756	12.9113	12.6482	12.3824	12.1166	11.8595
18	14.9643	14.6725	14.3831	14.0967	13.8135	13.5338	13.2558	12.9754	12.6954	12.4244
19	15.6505	15.3422	15.0367	14.7346	14.4360	14.1414	13.8488	13.5541	13.2602	12.9756
20	16.3202	15.9958	15.6746	15.3571	15.0436	14.7344	14.4275	14.1190	13.8115	13.5136
21	16.9739	16.6337	16.2972	15.9648	15.6366	15.3132	14.9924	14.6702	14.3495	14.0387
22	17.6118	17.2563	16.9048	16.5578	16.2154	15.8780	15.5436	15.2082	14.8745	14.5512
23	18.2343	17.8639	17.4978	17.1365	16.7802	16.4293	16.0816	15.7333	15.3870	15.0513
24	18.8419	18.4569	18.0765	17.7013	17.3315	16.9673	16.6067	16.2458	15.8871	15.5394
25	19.4349	19.0356	18.6414	18.2526	17.8695	17.4924	17.1191	16.7459	16.3752	16.0158
30	22.1929	21.7272	21.2683	20.8164	20.3716	19.9343	19.5024	19.0719	18.6453	18.2313
35	24.6348	24.1105	23.5943	23.0864	22.5871	22.0966	21.6127	21.1314	20.6554	20.1930
40	26.7971	26.2208	25.6538	25.0965	24.5489	24.0112	23.4813	22.9551	22.4351	21.9300
45	28.7117	28.0893	27.4775	26.8763	26.2859	25.7064	25.1357	24.5698	24.0111	23.4680
50	30.4069	29.7438	29.0922	28.4522	27.8239	27.2075	26.6007	25.9995	25.4064	24.8299

Notes: <1> Data Based on Assumed DOS of Apr 1993.
         Authorized Period of Use of Table is Oct 1992 through Sep 1993.
        <2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
         of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
         Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
         for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).
        <3> Region 3: DE, MD, DC, VA, WV, NC, SC, GA, FL, KY, TN, AL, MS, AR, LA, OK, TX

Table E-3-LP-3. Present Worth Factors--Liquified Petroleum Gas (LPG)

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9625	0.9294	0.9065	0.8942	0.8829	0.8719	0.8616	0.8486	0.8324	0.8151
2	1.8919	1.8358	1.8007	1.7771	1.7548	1.7335	1.7103	1.6810	1.6476	1.6114
3	2.7984	2.7300	2.6836	2.6490	2.6164	2.5822	2.5427	2.4962	2.4438	2.3881
4	3.6926	3.6129	3.5555	3.5106	3.4650	3.4146	3.3578	3.2925	3.2205	3.1446
5	4.5755	4.4848	4.4171	4.3593	4.2975	4.2297	4.1541	4.0691	3.9770	3.8809
6	5.4474	5.3465	5.2657	5.1917	5.1126	5.0260	4.9308	4.8256	4.7133	4.5979
7	6.3090	6.1951	6.0981	6.0068	5.9089	5.8027	5.6872	5.5620	5.4303	5.2956
8	7.1576	7.0275	6.9133	6.8031	6.6855	6.5591	6.4236	6.2790	6.1281	5.9743
9	7.9900	7.8426	7.7096	7.5798	7.4420	7.2955	7.1406	6.9767	6.8067	6.6363
10	8.8052	8.6389	8.4862	8.3362	8.1784	8.0125	7.8383	7.6553	7.4687	7.2841
11	9.6014	9.4156	9.2427	9.0726	8.8954	8.7102	8.5169	8.3173	8.1165	7.9180
12	10.3781	10.1721	9.9791	9.7896	9.5931	9.3888	9.1789	8.9652	8.7504	8.5379
13	11.1346	10.9084	10.6961	10.4873	10.2717	10.0508	9.8268	9.5990	9.3703	9.1441
14	11.8710	11.6254	11.3938	11.1659	10.9337	10.6987	10.4606	10.2189	9.9765	9.7366
15	12.5880	12.3231	12.0724	11.8279	11.5816	11.3325	11.0806	10.8251	10.5690	10.3157
16	13.2857	13.0018	12.7344	12.4758	12.2154	11.9525	11.6868	11.4177	11.1481	10.8807
17	13.9643	13.6638	13.3823	13.1096	12.8354	12.5586	12.2793	11.9967	11.7131	11.4312
18	14.6263	14.3116	14.0161	13.7296	13.4415	13.1512	12.8584	12.5618	12.2636	11.9674
19	15.2742	14.9455	14.6360	14.3357	14.0341	13.7303	13.4234	13.1122	12.7998	12.4896
20	15.9080	15.5654	15.2422	14.9283	14.6131	14.2953	13.9738	13.6484	13.3220	12.9981
21	16.5279	16.1716	15.8348	15.5074	15.1782	14.8457	14.5100	14.1706	13.8305	13.4931
22	17.1341	16.7641	16.4138	16.0724	15.7286	15.3819	15.0322	14.6791	14.3256	13.9745
23	17.7267	17.3432	16.9788	16.6228	16.2648	15.9041	15.5407	15.1742	14.8069	14.4419
24	18.3057	17.9082	17.5293	17.1590	16.7870	16.4126	16.0358	15.6555	15.2743	14.8951
25	18.8707	18.4587	18.0655	17.6812	17.2955	16.9077	16.5172	16.1229	15.7275	15.3340
30	21.4832	21.0020	20.5400	20.0868	19.6315	19.1737	18.7134	18.2499	17.7863	17.3264
35	23.7491	23.1982	22.6670	22.1456	21.6238	21.1012	20.5777	20.0531	19.5304	19.0132
40	25.6766	25.0625	24.4702	23.8896	23.3107	22.7327	22.1557	21.5793	21.0066	20.4410
45	27.3082	26.6406	25.9964	25.3659	24.7385	24.1137	23.4914	22.8712	22.2561	21.6496
50	28.6891	27.9762	27.2883	26.6154	25.9470	25.2826	24.6220	23.9647	23.3137	22.6725

Notes: <1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.

<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
for Residential Sector (NIST Annual Supplement to Handbook 135, Oct 1992).

<3> Region 3: DE, MD, DC, VA, WV, NC, SC, GA, FL, KY, TN, AL, MS, AR, LA, OK, TX

Table E-3-EL-4. Present Worth Factors--Electricity

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9640	0.9270	0.8939	0.8640	0.8389	0.8183	0.7970	0.7766	0.7563	0.7345
2	1.8910	1.8209	1.7579	1.7029	1.6573	1.6153	1.5736	1.5329	1.4908	1.4465
3	2.7849	2.6848	2.5968	2.5212	2.4542	2.3919	2.3299	2.2674	2.2028	2.1357
4	3.6489	3.5238	3.4151	3.3182	3.2308	3.1482	3.0644	2.9794	2.8920	2.8022
5	4.4878	4.3421	4.2121	4.0948	3.9871	3.8827	3.7764	3.6686	3.5585	3.4458
6	5.3061	5.1391	4.9887	4.8511	4.7216	4.5947	4.4656	4.3351	4.2021	4.0686
7	6.1031	5.9157	5.7450	5.5856	5.4336	5.2839	5.1321	4.9787	4.8249	4.6720
8	6.8797	6.6720	6.4795	6.2976	6.1228	5.9504	5.7757	5.6015	5.4283	5.2559
9	7.6360	7.4065	7.1915	6.9868	6.7893	6.5940	6.3985	6.2049	6.0122	5.8209
10	8.3705	8.1184	7.8807	7.6533	7.4330	7.2168	7.0018	6.7888	6.5773	6.3676
11	9.0825	8.8077	8.5472	8.2969	8.0557	7.8202	7.5858	7.3538	7.1239	6.8964
12	9.7717	9.4742	9.1908	8.9197	8.6591	8.4041	8.1508	7.9005	7.6527	7.4080
13	10.4382	10.1178	9.8136	9.5231	9.2430	8.9691	8.6974	8.4293	8.1644	7.9031
14	11.0818	10.7406	10.4170	10.1070	9.8081	9.5158	9.2263	8.9409	8.6594	8.3820
15	11.7046	11.3439	11.0009	10.6720	10.3547	10.0446	9.7379	9.4360	9.1383	8.8454
16	12.3080	11.9279	11.5660	11.2187	10.8835	10.5562	10.2329	9.9149	9.6017	9.2937
17	12.8919	12.4929	12.1126	11.7475	11.3952	11.0513	10.7119	10.3783	10.0501	9.7274
18	13.4569	13.0395	12.6414	12.2591	11.8902	11.5302	11.1753	10.8266	10.4837	10.1468
19	14.0036	13.5684	13.1531	12.7542	12.3691	11.9936	11.6236	11.2603	10.9031	10.5525
20	14.5324	14.0800	13.6481	13.2331	12.8326	12.4419	12.0572	11.6797	11.3088	10.9449
21	15.0440	14.5750	14.1270	13.6965	13.2809	12.8756	12.4766	12.0854	11.7012	11.3246
22	15.5391	15.0540	14.5904	14.1448	13.7145	13.2950	12.8823	12.4778	12.0809	11.6918
23	16.0180	15.5174	15.0388	14.5784	14.1339	13.7007	13.2748	12.8575	12.4481	12.0469
24	16.4814	15.9657	15.4724	14.9979	14.5396	14.0931	13.6544	13.2247	12.8032	12.3902
25	16.9297	16.3993	15.8918	15.4036	14.9320	14.4728	14.0216	13.5798	13.1465	12.7221
30	18.9606	18.3637	17.7919	17.2413	16.7092	16.1912	15.6832	15.1861	14.6995	14.2234
35	20.6790	20.0253	19.3982	18.7943	18.2106	17.6426	17.0862	16.5425	16.0107	15.4910
40	22.1304	21.4283	20.7546	20.1054	19.4781	18.8679	18.2707	17.6875	17.1176	16.5611
45	23.3557	22.6128	21.8997	21.2124	20.5482	19.9024	19.2708	18.6543	18.0521	17.4645
50	24.3902	23.6129	22.8664	22.1469	21.4516	20.7757	20.1150	19.4704	18.8411	18.2272

Notes: <1> Data Based on Assumed DOS of Apr 1993.
　　　　　　Authorized Period of Use of Table is Oct 1992 through Sep 1993.

　　　　<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
　　　　　　of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
　　　　　　Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
　　　　　　for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).

　　　　<3> Region 4: MT, ID, WY, CO, NM, AZ, UT, NV, WA, OR, CA, AK, HI

Table E-3-DO-4. Present Worth Factors--Distillate Oil

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9695	0.9553	0.9481	0.9481	0.9476	0.9474	0.9474	0.9429	0.9323	0.9190
2	1.9248	1.9034	1.8962	1.8957	1.8950	1.8947	1.8903	1.8753	1.8513	1.8216
3	2.8729	2.8515	2.8438	2.8431	2.8424	2.8377	2.8226	2.7943	2.7539	2.7058
4	3.8210	3.7991	3.7912	3.7905	3.7853	3.7700	3.7416	3.6969	3.6381	3.5710
5	4.7686	4.7465	4.7386	4.7334	4.7176	4.6890	4.6442	4.5810	4.5033	4.4167
6	5.7160	5.6939	5.6815	5.6657	5.6366	5.5916	5.5284	5.4462	5.3490	5.2432
7	6.6634	6.6368	6.6138	6.5847	6.5392	6.4758	6.3936	6.2920	6.1755	6.0502
8	7.6063	7.5691	7.5328	7.4874	7.4234	7.3410	7.2393	7.1185	6.9825	6.8363
9	8.5386	8.4881	8.4354	8.3715	8.2886	8.1867	8.0658	7.9254	7.7686	7.6031
10	9.4576	9.3908	9.3196	9.2367	9.1343	9.0132	8.8728	8.7115	8.5354	8.3535
11	10.3602	10.2749	10.1848	10.0824	9.9608	9.8202	9.6589	9.4783	9.2858	9.0877
12	11.2444	11.1401	11.0305	10.9089	10.7678	10.6063	10.4257	10.2287	10.0200	9.8057
13	12.1096	11.9858	11.8570	11.7159	11.5539	11.3731	11.1761	10.9629	10.7381	10.5079
14	12.9553	12.8124	12.6640	12.5020	12.3207	12.1235	11.9103	11.6810	11.4402	11.1942
15	13.7818	13.6193	13.4501	13.2688	13.0711	12.8577	12.6284	12.3831	12.1265	11.8650
16	14.5888	14.4054	14.2169	14.0192	13.8053	13.5757	13.3305	13.0695	12.7973	12.5194
17	15.3749	15.1722	14.9673	14.7534	14.5234	14.2779	14.0168	13.7402	13.4517	13.1570
18	16.1417	15.9226	15.7015	15.4715	15.2255	14.9642	14.6876	14.3947	14.0893	13.7781
19	16.8921	16.6568	16.4196	16.1736	15.9118	15.6350	15.3420	15.0323	14.7104	14.3830
20	17.6263	17.3749	17.1217	16.8600	16.5826	16.2894	15.9796	15.6534	15.3153	14.9720
21	18.3444	18.0770	17.8081	17.5307	17.2370	16.9270	16.6007	16.2582	15.9043	15.5454
22	19.0465	18.7634	18.4788	18.1852	17.8746	17.5481	17.2056	16.8472	16.4777	16.1030
23	19.7328	19.4341	19.1333	18.8228	18.4957	18.1530	17.7946	17.4207	17.0353	16.6443
24	20.4036	20.0886	19.7709	19.4438	19.1006	18.7420	18.3680	17.9782	17.5766	17.1693
25	21.0581	20.7262	20.3919	20.0487	19.6896	19.3154	18.9256	18.5196	18.1016	17.6777
30	24.0840	23.6721	23.2582	22.8350	22.3953	21.9401	21.4695	20.9833	20.4864	19.9855
35	26.7087	26.2160	25.7219	25.2198	24.7031	24.1727	23.6289	23.0719	22.5065	21.9394
40	28.9414	28.3755	27.8105	27.2399	26.6570	26.0625	25.4568	24.8398	24.2164	23.5932
45	30.8312	30.2033	29.5784	28.9498	28.3108	27.6621	27.0039	26.3362	25.6637	24.9930
50	32.4308	31.7504	31.0748	30.3972	29.7107	29.0161	28.3134	27.6028	26.8888	26.1779

Notes: <1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.

<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).

<3> Region 4: MT, ID, WY, CO, NM, AZ, UT, NV, WA, OR, CA, AK, HI

Table E-3-RO-4. Present Worth Factors--Residual Oil

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	1.0016	1.0264	1.0465	1.0618	1.0773	1.0914	1.1042	1.1119	1.1112	1.1041
2	2.0281	2.0729	2.1082	2.1390	2.1687	2.1956	2.2161	2.2231	2.2153	2.1954
3	3.0745	3.1347	3.1855	3.2304	3.2728	3.3075	3.3272	3.3271	3.3066	3.2712
4	4.1363	4.2119	4.2769	4.3346	4.3847	4.4186	4.4313	4.4185	4.3823	4.3287
5	5.2136	5.3034	5.3811	5.4465	5.4959	5.5227	5.5227	5.4942	5.4399	5.3660
6	6.3050	6.4075	6.4930	6.5577	6.6000	6.6141	6.5984	6.5518	6.4771	6.3828
7	7.4091	7.5194	7.6041	7.6618	7.6913	7.6898	7.6560	7.5890	7.4940	7.3784
8	8.5210	8.6306	8.7082	8.7531	8.7670	8.7474	8.6932	8.6058	8.4895	8.3528
9	9.6322	9.7347	9.7996	9.8288	9.8246	9.7846	9.7100	9.6014	9.4639	9.3069
10	10.7363	10.8260	10.8753	10.8864	10.8618	10.8014	10.7056	10.5758	10.4180	10.2406
11	11.8276	11.9017	11.9329	11.9236	11.8787	11.7970	11.6800	11.5299	11.3518	11.1542
12	12.9033	12.9593	12.9701	12.9405	12.8743	12.7714	12.6341	12.4637	12.2653	12.0477
13	13.9609	13.9965	13.9869	13.9360	13.8487	13.7255	13.5679	13.3772	13.1588	12.9213
14	14.9982	15.0134	14.9825	14.9104	14.8028	14.6593	14.4814	14.2707	14.0325	13.7754
15	16.0150	16.0089	15.9569	15.8645	15.7365	15.5728	15.3749	15.1444	14.8865	14.6100
16	17.0106	16.9834	16.9110	16.7983	16.6501	16.4663	16.2486	15.9984	15.7211	15.4243
17	17.9850	17.9375	17.8448	17.7118	17.5436	17.3400	17.1026	16.8330	16.5355	16.2177
18	18.9391	18.8712	18.7583	18.6053	18.4172	18.1940	17.9372	17.6474	17.3288	16.9905
19	19.8728	19.7847	19.6518	19.4790	19.2712	19.0286	18.7515	18.4407	18.1016	17.7431
20	20.7864	20.6782	20.5255	20.3330	20.1058	19.8429	19.5449	19.2135	18.8543	18.4760
21	21.6799	21.5519	21.3795	21.1676	20.9202	20.6363	20.3177	19.9662	19.5872	19.1895
22	22.5535	22.4059	22.2141	21.9820	21.7136	21.4091	21.0703	20.6990	20.3007	19.8833
23	23.4076	23.2405	23.0284	22.7753	22.4864	22.1617	21.8032	21.4126	20.9945	20.5569
24	24.2422	24.0549	23.8218	23.5481	23.2390	22.8946	22.5168	22.1063	21.6681	21.2101
25	25.0565	24.8482	24.5946	24.3008	23.9719	23.6082	23.2105	22.7800	22.3213	21.8427
30	28.8217	28.5139	28.1610	27.7678	27.3386	26.8740	26.3759	25.8455	25.2887	24.7143
35	32.0876	31.6792	31.2266	30.7352	30.2102	29.6521	29.0629	28.4444	27.8023	27.1455
40	34.8657	34.3662	33.8255	33.2488	32.6414	32.0036	31.3372	30.6442	29.9299	29.2034
45	37.2172	36.6406	36.0253	35.3764	34.6992	33.9940	33.2623	32.5061	31.7308	30.9452
50	39.2075	38.5657	37.8872	37.1773	36.4411	35.6787	34.8918	34.0822	33.2552	32.4195

Notes: <1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.
<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).
<3> Region 4: MT, ID, WY, CO, NM, AZ, UT, NV, WA, OR, CA, AK, HI

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Table E-3-NG-4. Present Worth Factors--Natural Gas

Number of Payments						Beneficial Occupancy Date					
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9871	0.9721	0.9583	0.9415	0.9330	0.9341	0.9406	0.9442	0.9470	0.9493
2	1.9592	1.9304	1.8998	1.8745	1.8671	1.8748	1.8848	1.8912	1.8964	1.8956
3	2.9175	2.8719	2.8328	2.8086	2.8078	2.8189	2.8319	2.8406	2.8427	2.8367
4	3.8591	3.8049	3.7670	3.7493	3.7519	3.7660	3.7812	3.7869	3.7837	3.7689
5	4.7921	4.7391	4.7076	4.6934	4.6990	4.7153	4.7275	4.7279	4.7160	4.6891
6	5.7262	5.6797	5.6518	5.6405	5.6483	5.6616	5.6685	5.6602	5.6361	5.5983
7	6.6668	6.6239	6.5988	6.5898	6.5946	6.6027	6.6008	6.5803	6.5453	6.5030
8	7.6110	7.5709	7.5482	7.5361	7.5357	7.5349	7.5209	7.4895	7.4501	7.4076
9	8.5580	8.5203	8.4944	8.4772	8.4679	8.4551	8.4302	8.3942	8.3547	8.3015
10	9.5074	9.4666	9.4355	9.4094	9.3881	9.3643	9.3349	9.2989	9.2486	9.1763
11	10.4537	10.4076	10.3678	10.3296	10.2973	10.2690	10.2395	10.1927	10.1233	10.0321
12	11.3947	11.3399	11.2879	11.2388	11.2020	11.1736	11.1334	11.0675	10.9792	10.8692
13	12.3270	12.2600	12.1971	12.1435	12.1066	12.0675	12.0082	11.9234	11.8163	11.6877
14	13.2471	13.1692	13.1018	13.0481	13.0005	12.9423	12.8640	12.7605	12.6348	12.4878
15	14.1563	14.0739	14.0065	13.9420	13.8753	13.7981	13.7011	13.5790	13.4349	13.2697
16	15.0611	14.9786	14.9003	14.8168	14.7311	14.6352	14.5196	14.3791	14.2168	14.0326
17	15.9657	15.8724	15.7751	15.6726	15.5682	15.4537	15.3197	15.1610	14.9797	14.7759
18	16.8596	16.7472	16.6310	16.5097	16.3867	16.2538	16.1016	15.9239	15.7230	15.4999
19	17.7343	17.6031	17.4681	17.3282	17.1868	17.0357	16.8645	16.6671	16.4470	16.2050
20	18.5902	18.4402	18.2865	18.1283	17.9687	17.7986	17.6078	17.3911	17.1521	16.8916
21	19.4273	19.2587	19.0866	18.9102	18.7316	18.5419	18.3318	18.0963	17.8387	17.5601
22	20.2458	20.0588	19.8685	19.6731	19.4749	19.2659	19.0369	18.7829	18.5072	18.2101
23	21.0459	20.8407	20.6315	20.4164	20.1989	19.9710	19.7235	19.4514	19.1571	18.8411
24	21.8278	21.6036	21.3747	21.1404	20.9040	20.6576	20.3920	20.1013	19.7882	19.4531
25	22.5907	22.3468	22.0987	21.8455	21.5906	21.3261	21.0419	20.7324	20.4002	20.0458
30	26.1182	25.7810	25.4400	25.0936	24.7448	24.3857	24.0074	23.6044	23.1802	22.7360
35	29.1778	28.7465	28.3120	27.8736	27.4350	26.9884	26.5247	26.0392	25.5351	25.0137
40	31.7805	31.2638	30.7467	30.2285	29.7127	29.1914	28.6555	28.1000	27.5284	26.9416
45	33.9835	33.3946	32.8076	32.2218	31.6406	31.0561	30.4590	29.8444	29.2155	28.5735
50	35.8481	35.1981	34.5520	33.9090	33.2724	32.6344	31.9856	31.3209	30.6436	29.9547

Notes: <1> Data Based on Assumed DOS of Apr 1993.
         Authorized Period of Use of Table is Oct 1992 through Sep 1993.
        <2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
         of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
         Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
         for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).
        <3> Region 4: MT, ID, WY, CO, NM, AZ, UT, NV, WA, OR, CA, AK, HI

Table E-3-SC-4. Present Worth Factors--Steam Coal

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9675	0.9332	0.9001	0.8601	0.8245	0.8027	0.7813	0.7649	0.7443	0.7199
2	1.9007	1.8333	1.7602	1.6845	1.6271	1.5839	1.5462	1.5092	1.4642	1.4162
3	2.8008	2.6934	2.5846	2.4872	2.4084	2.3488	2.2905	2.2291	2.1605	2.0896
4	3.6609	3.5179	3.3873	3.2685	3.1733	3.0931	3.0104	2.9254	2.8339	2.7408
5	4.4854	4.3205	4.1685	4.0334	3.9176	3.8130	3.7066	3.5988	3.4851	3.3724
6	5.2880	5.1018	4.9335	4.7777	4.6375	4.5093	4.3800	4.2500	4.1167	3.9884
7	6.0693	5.8667	5.6778	5.4976	5.3337	5.1827	5.0313	4.8816	4.7327	4.5923
8	6.8342	6.6110	6.3977	6.1938	6.0071	5.8339	5.6629	5.4976	5.3366	5.1843
9	7.5785	7.3309	7.0939	6.8672	6.6584	6.4655	6.2788	6.1015	5.9286	5.7624
10	8.2984	8.0271	7.7673	7.5185	7.2900	7.0815	6.8828	6.6935	6.5067	6.3266
11	8.9947	8.7005	8.4186	8.1501	7.9060	7.6854	7.4748	7.2716	7.0709	6.8773
12	9.6681	9.3518	9.0502	8.7660	8.5099	8.2774	8.0529	7.8359	7.6216	7.4148
13	10.3193	9.9834	9.6661	9.3700	9.1019	8.8555	8.6171	8.3865	8.1590	7.9393
14	10.9509	10.5994	10.2701	9.9620	9.6800	9.4198	9.1678	8.9240	8.6836	8.4512
15	11.5669	11.2033	10.8620	10.5401	10.2442	9.9704	9.7052	9.4485	9.1955	8.9508
16	12.1708	11.7953	11.4402	11.1043	10.7949	10.5079	10.2297	9.9604	9.6951	9.4384
17	12.7628	12.3734	12.0044	11.6550	11.3323	11.0324	10.7416	10.4600	10.1827	9.9142
18	13.3409	12.9376	12.5551	12.1924	11.8569	11.5443	11.2412	10.9476	10.6585	10.3787
19	13.9052	13.4883	13.0925	12.7169	12.3688	12.0439	11.7288	11.4234	11.1230	10.8319
20	14.4558	14.0257	13.6170	13.2288	12.8684	12.5315	12.2047	11.8879	11.5762	11.2743
21	14.9933	14.5502	14.1289	13.7284	13.3559	13.0074	12.6691	12.3411	12.0186	11.7060
22	15.5178	15.0621	14.6285	14.2160	13.8318	13.4718	13.1224	12.7835	12.4503	12.1274
23	16.0297	15.5617	15.1161	14.6919	14.2962	13.9251	13.5648	13.2152	12.8717	12.5386
24	16.5293	16.0493	15.5920	15.1563	14.7495	14.3674	13.9965	13.6366	13.2829	12.9400
25	17.0169	16.5252	16.0564	15.6096	15.1919	14.7992	14.4179	14.0478	13.6843	13.3317
30	19.2845	18.7384	18.2164	17.7176	17.2492	16.8071	16.3775	15.9604	15.5508	15.1533
35	21.2924	20.6980	20.1289	19.5842	19.0709	18.5850	18.1127	17.6538	17.2036	16.7664
40	23.0703	22.4332	21.8224	21.2369	20.6839	20.1592	19.6490	19.1533	18.6670	18.1946
45	24.6446	23.9696	23.3218	22.7003	22.1122	21.5531	21.0094	20.4810	19.9628	19.4592
50	26.0385	25.3300	24.6495	23.9961	23.3768	22.7873	22.2140	21.6566	21.1101	20.5790

Notes: <1> Data Based on Assumed DOS of Apr 1993.

            Authorized Period of Use of Table is Oct 1992 through Sep 1993.

        <2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
            of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
            Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
            for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).

        <3> Region 4: MT, ID, WY, CO, NM, AZ, UT, NV, WA, OR, CA, AK, HI

Table E-3-LP-4. Present Worth Factors--Liquified Petroleum Gas (LPG)

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9620	0.9292	0.9062	0.8930	0.8803	0.8688	0.8577	0.8440	0.8276	0.8098
2	1.8912	1.8353	1.7991	1.7733	1.7491	1.7265	1.7016	1.6715	1.6374	1.6005
3	2.7973	2.7283	2.6794	2.6420	2.6067	2.5704	2.5292	2.4814	2.4281	2.3713
4	3.6903	3.6086	3.5482	3.4997	3.4507	3.3980	3.3390	3.2720	3.1989	3.1220
5	4.5706	4.4774	4.4059	4.3437	4.2783	4.2078	4.1297	4.0428	3.9496	3.8524
6	5.4394	5.3350	5.2498	5.1712	5.0881	4.9985	4.9005	4.7935	4.6800	4.5631
7	6.2970	6.1790	6.0774	5.9811	5.8788	5.7693	5.6512	5.5240	5.3906	5.2543
8	7.1410	7.0066	6.8872	6.7717	6.6496	6.5200	6.3816	6.2346	6.0819	5.9264
9	7.9686	7.8164	7.6779	7.5425	7.4003	7.2504	7.0923	6.9258	6.7540	6.5819
10	8.7784	8.6070	8.4487	8.2932	8.1307	7.9611	7.7835	7.5979	7.4094	7.2234
11	9.5691	9.3778	9.1994	9.0237	8.8413	8.6523	8.4556	8.2534	8.0509	7.8510
12	10.3399	10.1286	9.9298	9.7343	9.5326	9.3244	9.1111	8.8949	8.6785	8.4648
13	11.0906	10.8590	10.6405	10.4256	10.2047	9.9799	9.7526	9.5225	9.2924	9.0650
14	11.8210	11.5696	11.3317	11.0976	10.8601	10.6214	10.3802	10.1363	9.8926	9.6517
15	12.5316	12.2609	12.0038	11.7531	11.5016	11.2490	10.9940	10.7365	10.4793	10.2251
16	13.2229	12.9330	12.6593	12.3946	12.1292	11.8628	11.5942	11.3233	11.0527	10.7846
17	13.8950	13.5884	13.3008	13.0222	12.7431	12.4630	12.1809	11.8966	11.6121	11.3296
18	14.5504	14.2299	13.9284	13.6361	13.3433	13.0497	12.7543	12.4561	12.1572	11.8605
19	15.1919	14.8575	14.5422	14.2363	13.9300	13.6231	13.3138	13.0011	12.6881	12.3776
20	15.8195	15.4714	15.1424	14.8230	14.5034	14.1826	13.8588	13.5321	13.2052	12.8811
21	16.4334	16.0716	15.7291	15.3964	15.0628	14.7276	14.3897	14.0491	13.7087	13.3713
22	17.0336	16.6583	16.3025	15.9558	15.6079	15.2585	14.9068	14.5526	14.1989	13.8479
23	17.6203	17.2317	16.8620	16.5009	16.1388	15.7756	15.4103	15.0428	14.6755	14.3107
24	18.1937	17.7911	17.4070	17.0318	16.6559	16.2791	15.9005	15.5194	15.1383	14.7595
25	18.7531	18.3362	17.9379	17.5488	17.1594	16.7693	16.3771	15.9822	15.5870	15.1941
30	21.3399	20.8545	20.3881	19.9307	19.4723	19.0129	18.5517	18.0883	17.6256	17.1668
35	23.5835	23.0291	22.4942	21.9693	21.4451	20.9215	20.3977	19.8737	19.3525	18.8371
40	25.4921	24.8751	24.2796	23.6962	23.1154	22.5370	21.9602	21.3850	20.8142	20.2508
45	27.1076	26.4376	25.7909	25.1579	24.5291	23.9044	23.2828	22.6642	22.0514	21.4475
50	28.4750	27.7601	27.0700	26.3951	25.7258	25.0618	24.4022	23.7469	23.0986	22.4604

Notes:

<1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.

<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
for Residential Sector (NIST Annual Supplement to Handbook 135, Oct 1992).

<3> Region 4: MT, ID, WY, CO, NM, AZ, UT, NV, WA, OR, CA, AK, HI

Table E-3-EL-5. Present Worth Factors--Electricity

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9619	0.9297	0.8968	0.8620	0.8311	0.8058	0.7846	0.7652	0.7429	0.7205
2	1.8916	1.8265	1.7588	1.6931	1.6369	1.5904	1.5498	1.5081	1.4634	1.4196
3	2.7884	2.6885	2.5899	2.4989	2.4215	2.3556	2.2927	2.2286	2.1625	2.0988
4	3.6504	3.5196	3.3957	3.2835	3.1867	3.0985	3.0132	2.9277	2.8417	2.7572
5	4.4815	4.3254	4.1803	4.0487	3.9296	3.8190	3.7123	3.6069	3.5001	3.3935
6	5.2873	5.1100	4.9455	4.7916	4.6501	4.5181	4.3915	4.2653	4.1364	4.0086
7	6.0719	5.8752	5.6884	5.5121	5.3492	5.1973	5.0499	4.9016	4.7515	4.6028
8	6.8371	6.6181	6.4089	6.2112	6.0285	5.8557	5.6862	5.5167	5.3457	5.1780
9	7.5800	7.3386	7.1080	6.8904	6.6868	6.4920	6.3013	6.1109	5.9209	5.7351
10	8.3005	8.0377	7.7872	7.5488	7.3231	7.1071	6.8955	6.6861	6.4780	6.2741
11	8.9996	8.7170	8.4456	8.1851	7.9382	7.7013	7.4707	7.2432	7.0170	6.7956
12	9.6788	9.3753	9.0819	8.8002	8.5324	8.2765	8.0278	7.7822	7.5385	7.3001
13	10.3372	10.0116	9.6970	9.3944	9.1076	8.8336	8.5669	8.3037	8.0430	7.7882
14	10.9735	10.6267	10.2912	9.9696	9.6648	9.3726	9.0883	8.8082	8.5311	8.2605
15	11.5886	11.2209	10.8664	10.5268	10.2038	9.8941	9.5928	9.2963	9.0034	8.7175
16	12.1828	11.7961	11.4235	11.0658	10.7252	10.3986	10.0809	9.7686	9.4604	9.1595
17	12.7580	12.3533	11.9625	11.5872	11.2297	10.8867	10.5532	10.2256	9.9024	9.5871
18	13.3151	12.8923	12.4840	12.0917	11.7179	11.3590	11.0102	10.6676	10.3300	10.0007
19	13.8541	13.4137	12.9885	12.5799	12.1901	11.8160	11.4522	11.0952	10.7436	10.4007
20	14.3756	13.9182	13.4766	13.0521	12.6471	12.2580	11.8798	11.5088	11.1436	10.7877
21	14.8801	14.4064	13.9489	13.5091	13.0892	12.6856	12.2934	11.9088	11.5306	11.1620
22	15.3682	14.8786	14.4059	13.9511	13.5167	13.0992	12.6934	12.2958	11.9049	11.5241
23	15.8405	15.3356	14.8479	14.3787	13.9303	13.4992	13.0804	12.6701	12.2670	11.8743
24	16.2975	15.7777	15.2755	14.7923	14.3303	13.8862	13.4548	13.0322	12.6172	12.2128
25	16.7395	16.2052	15.6891	15.1923	14.7173	14.2606	13.8168	13.3824	12.9557	12.5401
30	18.7420	18.1423	17.5627	17.0044	16.4698	15.9551	15.4552	14.9663	14.4870	14.0205
35	20.4366	19.7806	19.1466	18.5358	17.9502	17.3862	16.8387	16.3038	15.7799	15.2704
40	21.8677	21.1641	20.4841	19.8287	19.2000	18.5945	18.0067	17.4329	16.8715	16.3256
45	23.0760	22.3321	21.6132	20.9202	20.2552	19.6145	18.9928	18.3861	17.7930	17.2164
50	24.0960	23.3182	22.5664	21.8417	21.1460	20.4757	19.8253	19.1909	18.5709	17.9684

Notes: <1> Data Based on Assumed DOS of Apr 1993.
               Authorized Period of Use of Table is Oct 1992 through Sep 1993.
         <2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
               of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
               Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
               for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).

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ENERGY STUDIES: U.S. AVERAGE

Table E-3-DO-5. Present Worth Factors--Distillate Oil

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9695	0.9553	0.9472	0.9463	0.9459	0.9457	0.9458	0.9414	0.9316	0.9183
2	1.9248	1.9025	1.8935	1.8923	1.8916	1.8915	1.8872	1.8730	1.8499	1.8202
3	2.8720	2.8488	2.8394	2.8380	2.8374	2.8329	2.8188	2.7913	2.7518	2.7044
4	3.8183	3.7947	3.7852	3.7838	3.7788	3.7645	3.7371	3.6932	3.6360	3.5696
5	4.7642	4.7405	4.7309	4.7252	4.7104	4.6828	4.6390	4.5774	4.5012	4.4147
6	5.7100	5.6862	5.6724	5.6568	5.6287	5.5847	5.5232	5.4426	5.3463	5.2401
7	6.6557	6.6277	6.6039	6.5750	6.5306	6.4689	6.3884	6.2877	6.1717	6.0465
8	7.5972	7.5593	7.5222	7.4770	7.4148	7.3341	7.2335	7.1131	6.9781	6.8326
9	8.5287	8.4775	8.4242	8.3611	8.2800	8.1792	8.0589	7.9195	7.7642	7.5994
10	9.4470	9.3795	9.3083	9.2263	9.1251	9.0046	8.8653	8.7056	8.5309	8.3498
11	10.3490	10.2636	10.1735	10.0715	9.9505	9.8110	9.6514	9.4724	9.2814	9.0840
12	11.2331	11.1288	11.0187	10.8968	10.7569	10.5971	10.4181	10.2228	10.0155	9.8020
13	12.0983	11.9740	11.8440	11.7032	11.5430	11.3639	11.1686	10.9570	10.7336	10.5042
14	12.9434	12.7993	12.6504	12.4893	12.3098	12.1143	11.9027	11.6750	11.4358	11.1905
15	13.7688	13.6057	13.4365	13.2561	13.0602	12.8485	12.6208	12.3772	12.1221	11.8613
16	14.5752	14.3918	14.2033	14.0065	13.7944	13.5665	13.3230	13.0635	12.7928	12.5157
17	15.3613	15.1586	14.9537	14.7407	14.5125	14.2687	14.0093	13.7343	13.4473	13.1533
18	16.1281	15.9090	15.6879	15.4588	15.2146	14.9550	14.6800	14.3887	14.0849	13.7744
19	16.8785	16.6432	16.4060	16.1609	15.9009	15.6258	15.3345	15.0263	14.7060	14.3793
20	17.6127	17.3613	17.1081	16.8473	16.5717	16.2802	15.9721	15.6474	15.3109	14.9683
21	18.3308	18.0634	17.7945	17.5180	17.2261	16.9178	16.5932	16.2523	15.8999	15.5417
22	19.0329	18.7498	18.4652	18.1725	17.8637	17.5389	17.1981	16.8413	16.4733	16.0993
23	19.7193	19.4205	19.1197	18.8101	18.4848	18.1438	17.7870	17.4147	17.0308	16.6406
24	20.3900	20.0750	19.7573	19.4312	19.0897	18.7328	18.3605	17.9723	17.5722	17.1656
25	21.0445	20.7126	20.3783	20.0360	19.6787	19.3062	18.9180	18.5136	18.0972	17.6740
30	24.0705	23.6585	23.2446	22.8223	22.3844	21.9309	21.4620	20.9773	20.4820	19.9818
35	26.6951	26.2024	25.7083	25.2071	24.6922	24.1635	23.6214	23.0660	22.5021	21.9357
40	28.9278	28.3619	27.7969	27.2273	26.6461	26.0534	25.4492	24.8339	24.2120	23.5895
45	30.8176	30.1897	29.5648	28.9372	28.2999	27.6529	26.9964	26.3302	25.6593	24.9893
50	32.4172	31.7368	31.0612	30.3845	29.6998	29.0069	28.3059	27.5968	26.8844	26.1742

Notes: <1> Data Based on Assumed DOS of Apr 1993.
　　　　Authorized Period of Use of Table is Oct 1992 through Sep 1993.
　　　<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
　　　　of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
　　　　Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
　　　　for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).

Table E-3-RO-5. Present Worth Factors--Residual Oil

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	1.0038	1.0310	1.0516	1.0659	1.0819	1.0966	1.1111	1.1193	1.1175	1.1107
2	2.0348	2.0826	2.1175	2.1478	2.1785	2.2077	2.2304	2.2368	2.2282	2.2087
3	3.0865	3.1485	3.1995	3.2444	3.2896	3.3270	3.3480	3.3475	3.3262	3.2911
4	4.1523	4.2304	4.2960	4.3555	4.4089	4.4445	4.4586	4.4455	4.4087	4.3555
5	5.2343	5.3270	5.4072	5.4748	5.5265	5.5552	5.5566	5.5279	5.4730	5.3995
6	6.3308	6.4381	6.5265	6.5923	6.6371	6.6532	6.6391	6.5923	6.5170	6.4231
7	7.4420	7.5574	7.6440	7.7030	7.7351	7.7357	7.7035	7.6363	7.5406	7.4263
8	8.5613	8.6750	8.7546	8.8010	8.8176	8.8000	8.7474	8.6599	8.5438	8.4083
9	9.6788	9.7856	9.8527	9.8835	9.8820	9.8440	9.7710	9.6631	9.5258	9.3690
10	10.7894	10.8836	10.9351	10.9478	10.9259	10.8676	10.7743	10.6451	10.4865	10.3092
11	11.8875	11.9661	11.9995	11.9918	11.9495	11.8708	11.7563	11.6058	11.4267	11.2290
12	12.9699	13.0305	13.0435	13.0154	12.9528	12.8529	12.7170	12.5460	12.3466	12.1287
13	14.0343	14.0744	14.0671	14.0187	13.9348	13.8135	13.6572	13.4659	13.2462	13.0084
14	15.0783	15.0980	15.0703	15.0007	14.8955	14.7537	14.5770	14.3655	14.1259	13.8683
15	16.1019	16.1013	16.0523	15.9614	15.8357	15.6736	15.4767	15.2452	14.9858	14.7087
16	17.1051	17.0833	17.0130	16.9015	16.7555	16.5732	16.3564	16.1051	15.8262	15.5286
17	18.0871	18.0440	17.9532	17.8214	17.6552	17.4529	17.2163	16.9455	16.6462	16.3275
18	19.0478	18.9842	18.8730	18.7211	18.5349	18.3129	18.0566	17.7655	17.4450	17.1056
19	19.9880	19.9040	19.7727	19.6007	19.3948	19.1532	18.8766	18.5643	18.2231	17.8635
20	20.9078	20.8037	20.6524	20.4607	20.2351	19.9732	19.6754	19.3424	18.9810	18.6014
21	21.8075	21.6834	21.5123	21.3010	21.0551	20.7720	20.4536	20.1003	19.7189	19.3199
22	22.6872	22.5433	22.3527	22.1210	21.8539	21.5502	21.2114	20.8382	20.4374	20.0184
23	23.5471	23.3836	23.1726	22.9198	22.6321	22.3080	21.9494	21.5567	21.1359	20.6967
24	24.3875	24.2036	23.9715	23.6980	23.3899	23.0459	22.6678	22.2552	21.8142	21.3544
25	25.2074	25.0024	24.7496	24.4558	24.1278	23.7644	23.3664	22.9335	22.4719	21.9914
30	28.9987	28.6934	28.3407	27.9467	27.5178	27.0528	26.5536	26.0202	25.4598	24.8827
35	32.2870	31.8806	31.4274	30.9346	30.4092	29.8501	29.2591	28.6370	27.9908	27.3307
40	35.0843	34.5861	34.0442	33.4656	32.8572	32.2178	31.5492	30.8520	30.1331	29.4028
45	37.4520	36.8762	36.2592	35.6079	34.9292	34.2219	33.4875	32.7268	31.9464	31.1566
50	39.4561	38.8145	38.1340	37.4212	36.6831	35.9182	35.1282	34.3137	33.4812	32.6411

Notes: <1> Data Based on Assumed DOS of Apr 1993.
         Authorized Period of Use of Table is Oct 1992 through Sep 1993.
        <2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
         of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
         Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
         for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).

Table E-3-NG-5. Present Worth Factors—Natural Gas

Number of Payments	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
					Beneficial Occupancy Date					
1	0.9918	0.9794	0.9682	0.9548	0.9504	0.9579	0.9711	0.9806	0.9903	0.9978
2	1.9712	1.9476	1.9229	1.9052	1.9083	1.9290	1.9517	1.9709	1.9881	1.9969
3	2.9394	2.9023	2.8734	2.8631	2.8794	2.9096	2.9420	2.9687	2.9871	2.9954
4	3.8941	3.8528	3.8312	3.8342	3.8600	3.8999	3.9398	3.9678	3.9857	3.9883
5	4.8446	4.8106	4.8023	4.8148	4.8503	4.8977	4.9389	4.9664	4.9786	4.9715
6	5.8024	5.7817	5.7830	5.8051	5.8481	5.8967	5.9375	5.9593	5.9618	5.9470
7	6.7735	6.7624	6.7733	6.8029	6.8472	6.8953	6.9304	6.9424	6.9373	6.9209
8	7.7542	7.7526	7.7711	7.8019	7.8458	7.8882	7.9135	7.9179	7.9112	7.8987
9	8.7445	8.7505	8.7701	8.8005	8.8387	8.8714	8.8891	8.8918	8.8890	8.8672
10	9.7423	9.7495	9.7687	9.7934	9.8218	9.8469	9.8629	9.8696	9.8575	9.8150
11	10.7413	10.7481	10.7616	10.7766	10.7974	10.8208	10.8407	10.8381	10.8053	10.7423
12	11.7399	11.7410	11.7448	11.7521	11.7712	11.7986	11.8092	11.7859	11.7326	11.6493
13	12.7328	12.7242	12.7203	12.7260	12.7490	12.7671	12.7571	12.7133	12.6396	12.5361
14	13.7160	13.6997	13.6941	13.7038	13.7175	13.7149	13.6844	13.6202	13.5264	13.4030
15	14.6915	14.6735	14.6720	14.6723	14.6654	14.6422	14.5913	14.5071	14.3933	14.2502
16	15.6654	15.6514	15.6405	15.6201	15.5927	15.5492	15.4782	15.3740	15.2405	15.0768
17	16.6432	16.6199	16.5883	16.5474	16.4996	16.4360	16.3451	16.2211	16.0671	15.8822
18	17.6117	17.5677	17.5156	17.4544	17.3865	17.3029	17.1923	17.0478	16.8725	16.6666
19	18.5595	18.4950	18.4226	18.3412	18.2534	18.1501	18.0189	17.8531	17.6569	17.4306
20	19.4868	19.4020	19.3094	19.2081	19.1006	18.9767	18.8242	18.6375	18.4209	18.1745
21	20.3938	20.2888	20.1763	20.0553	19.9272	19.7821	19.6086	19.4015	19.1648	18.8988
22	21.2806	21.1557	21.0235	20.8819	20.7325	20.5665	20.3726	20.1455	19.8891	19.6031
23	22.1475	22.0029	21.8501	21.6873	21.5170	21.3305	21.1166	20.8698	20.5933	20.2868
24	22.9947	22.8295	22.6554	22.4717	22.2809	22.0744	21.8409	21.5740	21.2771	20.9499
25	23.8213	23.6348	23.4399	23.2357	23.0249	22.7987	22.5451	22.2577	21.9402	21.5920
30	27.6433	27.3557	27.0601	26.7550	26.4424	26.1138	25.7582	25.3695	24.9523	24.5069
35	30.9584	30.5688	30.1719	29.7671	29.3572	28.9338	28.4857	28.0076	27.5038	26.9747
40	33.7784	33.2963	32.8099	32.3186	31.8251	31.3207	30.7943	30.2405	29.6635	29.0636
45	36.1653	35.6049	35.0429	34.4783	33.9139	33.3411	32.7484	32.1305	31.4915	30.8317
50	38.1857	37.5590	36.9329	36.3063	35.6820	35.0512	34.4024	33.7303	33.0389	32.3283

Notes: <1> Data Based on Assumed DOS of Apr 1993.
              Authorized Period of Use of Table is Oct 1992 through Sep 1993.
        <2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
              of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
              Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
              for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).

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Table E-3-SC-5. Present Worth Factors--Steam Coal

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9762	0.9527	0.9296	0.9017	0.8745	0.8554	0.8387	0.8198	0.7990	0.7786
2	1.9289	1.8824	1.8314	1.7763	1.7299	1.6940	1.6585	1.6188	1.5775	1.5370
3	2.8586	2.7841	2.7059	2.6316	2.5685	2.5138	2.4574	2.3973	2.3360	2.2797
4	3.7603	3.6586	3.5613	3.4703	3.3883	3.3128	3.2360	3.1558	3.0786	3.0084
5	4.6348	4.5140	4.3999	4.2901	4.1873	4.0913	3.9945	3.8985	3.8074	3.7214
6	5.4902	5.3527	5.2197	5.0890	4.9659	4.8498	4.7371	4.6272	4.5204	4.4189
7	6.3288	6.1725	6.0187	5.8676	5.7244	5.5925	5.4658	5.3402	5.2179	5.1025
8	7.1486	6.9714	6.7972	6.6261	6.4670	6.3212	6.1789	6.0377	5.9015	5.7724
9	7.9476	7.7500	7.5557	7.3687	7.1957	7.0342	6.8763	6.7213	6.5714	6.4274
10	8.7261	8.5085	8.2984	8.0974	7.9088	7.7317	7.5600	7.3912	7.2264	7.0667
11	9.4846	9.2511	9.0271	8.8105	8.6062	8.4153	8.2298	8.0462	7.8657	7.6906
12	10.2273	9.9798	9.7401	9.5079	9.2898	9.0852	8.8848	8.6855	8.4896	8.2995
13	10.9560	10.6929	10.4376	10.1916	9.9597	9.7402	9.5241	9.3094	9.0985	8.8938
14	11.6690	11.3903	11.1212	10.8614	10.6147	10.3795	10.1480	9.9183	9.6927	9.4737
15	12.3665	12.0740	11.7911	11.5165	11.2540	11.0034	10.7569	10.5125	10.2727	10.0398
16	13.0501	12.7438	12.4461	12.1557	11.8779	11.6123	11.3512	11.0925	10.8388	10.5922
17	13.7200	13.3988	13.0854	12.7796	12.4868	12.2065	11.9312	11.6586	11.3912	11.1314
18	14.3750	14.0381	13.7093	13.3885	13.0811	12.7865	12.4972	12.2110	11.9303	11.6576
19	15.0143	14.6620	14.3182	13.9828	13.6611	13.3526	13.0496	12.7501	12.4565	12.1711
20	15.6382	15.2709	14.9124	14.5628	14.2271	13.9050	13.5888	13.2763	12.9701	12.6723
21	16.2471	15.8652	15.4924	15.1288	14.7795	14.4441	14.1150	13.7899	13.4713	13.1615
22	16.8414	16.4452	16.0585	15.6813	15.3187	14.9703	14.6285	14.2911	13.9604	13.6389
23	17.4213	17.0112	16.6109	16.2204	15.8449	15.4839	15.1297	14.7802	14.4378	14.1048
24	17.9874	17.5636	17.1500	16.7466	16.3584	15.9851	15.6189	15.2576	14.9037	14.5595
25	18.5398	18.1028	17.6762	17.2602	16.8596	16.4742	16.0963	15.7235	15.3585	15.0033
30	21.1091	20.6103	20.1234	19.6485	19.1906	18.7492	18.3165	17.8904	17.4732	17.0672
35	23.3840	22.8305	22.2903	21.7633	21.2545	20.7635	20.2824	19.8091	19.3458	18.8947
40	25.3983	24.7964	24.2090	23.6359	23.0821	22.5471	22.0232	21.5079	21.0038	20.5129
45	27.1819	26.5372	25.9079	25.2939	24.7002	24.1264	23.5645	23.0122	22.4719	21.9457
50	28.7612	28.0785	27.4121	26.7620	26.1331	25.5247	24.9292	24.3442	23.7718	23.2144

Notes: <1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.
<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
for Industrial Sector (NIST Annual Supplement to Handbook 135, Oct 1992).

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Table E-3-LP-5. Present Worth Factors--Liquified Petroleum Gas (LPG)

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9626	0.9297	0.9080	0.8976	0.8876	0.8783	0.8693	0.8573	0.8421	0.8254
2	1.8923	1.8377	1.8057	1.7853	1.7659	1.7476	1.7265	1.6994	1.6675	1.6327
3	2.8003	2.7353	2.6933	2.6636	2.6352	2.6049	2.5687	2.5248	2.4748	2.4210
4	3.6979	3.6230	3.5716	3.5329	3.4925	3.4470	3.3941	3.3321	3.2631	3.1896
5	4.5856	4.5013	4.4409	4.3901	4.3346	4.2724	4.2014	4.1204	4.0317	3.9385
6	5.4639	5.3706	5.2982	5.2323	5.1600	5.0797	4.9897	4.8890	4.7807	4.6681
7	6.3332	6.2278	6.1403	6.0577	5.9673	5.8680	5.7583	5.6379	5.5103	5.3785
8	7.1904	7.0700	6.9657	6.8650	6.7556	6.6366	6.5072	6.3675	6.2207	6.0698
9	8.0326	7.8954	7.7730	7.6533	7.5242	7.3855	7.2368	7.0779	6.9119	6.7443
10	8.8580	8.7027	8.5613	8.4219	8.2731	8.1151	7.9472	7.7692	7.5864	7.4044
11	9.6653	9.4910	9.3299	9.1708	9.0028	8.8255	8.6385	8.4437	8.2466	8.0502
12	10.4536	10.2596	10.0788	9.9004	9.7131	9.5168	9.3130	9.1038	8.8924	8.6819
13	11.2222	11.0085	10.8084	10.6108	10.4044	10.1913	9.9731	9.7496	9.5240	9.2995
14	11.9711	11.7381	11.5188	11.3021	11.0789	10.8514	10.6189	10.3813	10.1417	9.9033
15	12.7007	12.4485	12.2101	11.9766	11.7390	11.4972	11.2506	10.9989	10.7454	10.4933
16	13.4111	13.1398	12.8846	12.6367	12.3849	12.1289	11.8682	11.6027	11.3354	11.0690
17	14.1024	13.8143	13.5447	13.2825	13.0165	12.7465	12.4720	12.1927	11.9111	11.6299
18	14.7769	14.4744	14.1905	13.9142	13.6341	13.3503	13.0620	12.7684	12.4720	12.1762
19	15.4370	15.1202	14.8222	14.5318	14.2379	13.9403	13.6377	13.3292	13.0183	12.7083
20	16.0828	15.7519	15.4398	15.1355	14.8279	14.5160	14.1985	13.8756	13.5504	13.2264
21	16.7145	16.3695	16.0436	15.7256	15.4036	15.0769	14.7449	14.4076	14.0685	13.7308
22	17.3321	16.9732	16.6336	16.3012	15.9645	15.6232	15.2769	14.9258	14.5729	14.2212
23	17.9358	17.5633	17.2093	16.8621	16.5108	16.1553	15.7950	15.4302	15.0634	14.6975
24	18.5259	18.1390	17.7702	17.4084	17.0429	16.6734	16.2995	15.9206	15.5396	15.1592
25	19.1016	18.6998	18.3165	17.9405	17.5610	17.1778	16.7899	16.3968	16.0014	15.6065
30	21.7634	21.2912	20.8378	20.3915	19.9411	19.4866	19.0277	18.5640	18.0991	17.6365
35	24.0721	23.5290	23.0050	22.4893	21.9711	21.4505	20.9272	20.4013	19.8761	19.3552
40	26.0361	25.4285	24.8422	24.2663	23.6898	23.1129	22.5351	21.9564	21.3803	20.8100
45	27.6985	27.0364	26.3973	25.7704	25.1446	24.5200	23.8960	23.2727	22.6534	22.0414
50	29.1055	28.3973	27.7136	27.0435	26.3760	25.7110	25.0479	24.3869	23.7310	23.0837

Notes: <1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.

<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design.
Data Based on Discount Rate of 4.0% and DOE Projections of Future Price Level Changes
for Residential Sector (NIST Annual Supplement to Handbook 135, Oct 1992).

Part II. Tables of Present Worth Factors for Non-Energy Studies

Part II contains tables of present worth factors for use in computing the life-cycle costs of the competing alternatives in a non-energy study, where energy costs are either nonexistent or equal among all alternatives, in accordance with the provisions of governing DoD criteria (see Appendix A).

Table NE-1-1, "Present Worth Factors--One-Time Costs, Zero Differential Escalation," provides factors for costs which occur one time or at irregular time intervals throughout the study period and which increase at approximately the rate of general inflation (hence the term "zero differential escalation"). These costs may include construction/acquisition costs, non-annually recurring maintenance costs, major repair and replacement costs, and retention/salvage value or disposal cost. These factors are called "single present worth" (SPW) factors. The present worth of each cost occurrence is found by multiplying that cost, in Date-of-Study (DOS) prices, by the SPW factor corresponding to the time of occurrence (years after DOS). Interpolation is encouraged for non-integer time periods.

Table NE-1-2, "Present Worth Factors--One-Time Costs, Non-Zero Differential Escalation," provides present worth factors for costs which occur one time or at irregular intervals throughout the study period and which change faster or more slowly than general price inflation. The "differential escalation rate" is the difference between the rate of increase in the particular type of cost under consideration and general price inflation[1]. Present worth factors are shown for differential escalation rates ranging from -5% to + 5% in 1% increments. These factors are sometimes called "modified single present worth" (SPW*) factors. The present worth of each cost occurrence is found by multiplying that cost, in DOS prices, by the SPW* factor corresponding to the time of occurrence (years after DOS) and the differential escalation rate. Interpolation is encouraged for time periods and escalation rates other than those shown on the table.

Table NE-2-1 provides present worth factors for costs which are incurred annually throughout the study period, such as routine maintenance and repair costs, and which are not expected to change faster or more slowly than the rate of general inflation. These factors are called "uniform present worth" (UPW) factors. The factors in this table are based on the assumption that the DOS is in April 1993, the beneficial occupancy date is in October of the same year or a future year, and that the annual cost occurs approximately at mid-year during each year of occupancy, or represents the sum of several costs distributed relatively uniformly throughout the year. The present worth of a cost recurring annually over the study period is found by multiplying the annual amount, in DOS prices, by the appropriate UPW factor. The number of payments generally corresponds to the number of years in the study period after the beneficial occupancy date. Interpolation is encouraged for study periods and for beneficial occupancy dates other than those shown on the tables.

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[1] A more accurate way of calculating the differential escalation rate for a project-related cost is:

$$e = (1+E)/(1+I) -1$$

where e = the differential escalation rate,
E = the actual escalation rate, and
I = the rate of general inflation.

Tables NE-2-2 through NE-2-11 provide present worth factors for costs which are incurred annually throughout the study period and which are expected to change faster or more slowly than the rate of general inflation. The differential rate of escalation is included in the table title; these differential rates range from -5% to +5% in 1% increments. Present worth factors which include escalation are sometimes called "modified uniform present worth" (UPW*) factors. The UPW* factors in this table are based on the assumption that the DOS is in April 1993, the beneficial occupancy date is in October of the same year or a future year, and that the annual cost occurs approximately at mid-year during each year of occupancy, or represents the sum of several costs distributed relatively uniformly throughout the year. The present worth of a cost recurring annually over the study period is found by multiplying the annual amount, in DOS prices, by the appropriate UPW* factor. The number of payments generally corresponds to the number of years in the study period after the beneficial occupancy date. Interpolation is encouraged for study periods and escalation rates and beneficial occupancy dates other than those shown on the tables.

Table NE-1-1. Present Worth Factors--One-Time Costs
Zero Differential Escalation (e = 0%)

Time Cost Incurred (Years after DOS)	SPW Factor	Time Cost Incurred (Years after DOS)	SPW Factor
0.00	1.0000	16	0.2176
0.25	0.9765	17	0.1978
0.50	0.9535	18	0.1799
0.75	0.9310	19	0.1635
		20	0.1486
1	0.9091	21	0.1351
2	0.8264	22	0.1228
3	0.7513	23	0.1117
4	0.6830	24	0.1015
5	0.6209	25	0.0923
6	0.5645	26	0.0839
7	0.5132	27	0.0763
8	0.4665	28	0.0693
9	0.4241	29	0.0630
10	0.3855	30	0.0573
11	0.3505	35	0.0356
12	0.3186	40	0.0221
13	0.2897	45	0.0137
14	0.2633	50	0.0085
15	0.2394		

Notes: <1> Tabulated SPW Factors Valid for Indefinite Period (Not Calendar-Dependent)
<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design. (Discount Rate = 10%)
<3> Covers Costs such as Construction, Procurement, Replacement, Disposal.

Table NE-1-2.   Present Worth Factors--One-Time Costs
Non-Zero Differential Escalation

Time Cost Incurred (Years after DOS)	Differential Escalation Rate									
	-5%	-4%	-3%	-2%	-1%	1%	2%	3%	4%	5%
0.00	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000
0.25	0.9640	0.9665	0.9690	0.9715	0.9740	0.9789	0.9813	0.9837	0.9861	0.9884
0.50	0.9293	0.9342	0.9391	0.9439	0.9487	0.9582	0.9629	0.9677	0.9723	0.9770
0.75	0.8959	0.9029	0.9100	0.9170	0.9240	0.9380	0.9449	0.9519	0.9588	0.9657
1	0.8636	0.8727	0.8818	0.8909	0.9000	0.9182	0.9273	0.9364	0.9455	0.9545
2	0.7459	0.7617	0.7776	0.7937	0.8100	0.8431	0.8598	0.8768	0.8939	0.9112
3	0.6442	0.6647	0.6857	0.7071	0.7290	0.7741	0.7973	0.8210	0.8451	0.8697
4	0.5563	0.5801	0.6047	0.6300	0.6561	0.7107	0.7393	0.7687	0.7990	0.8302
5	0.4805	0.5063	0.5332	0.5613	0.5905	0.6526	0.6855	0.7198	0.7554	0.7925
6	0.4149	0.4418	0.4702	0.5000	0.5314	0.5992	0.6357	0.6740	0.7142	0.7564
7	0.3584	0.3856	0.4146	0.4455	0.4783	0.5502	0.5895	0.6311	0.6753	0.7221
8	0.3095	0.3365	0.3656	0.3969	0.4305	0.5052	0.5466	0.5910	0.6384	0.6892
9	0.2673	0.2937	0.3224	0.3536	0.3874	0.4638	0.5068	0.5534	0.6036	0.6579
10	0.2308	0.2563	0.2843	0.3150	0.3487	0.4259	0.4700	0.5181	0.5707	0.6280
11	0.1994	0.2237	0.2507	0.2807	0.3138	0.3910	0.4358	0.4852	0.5396	0.5995
12	0.1722	0.1952	0.2211	0.2500	0.2824	0.3590	0.4041	0.4543	0.5101	0.5722
13	0.1487	0.1704	0.1950	0.2228	0.2542	0.3297	0.3747	0.4254	0.4823	0.5462
14	0.1284	0.1487	0.1719	0.1985	0.2288	0.3027	0.3475	0.3983	0.4560	0.5214
15	0.1109	0.1298	0.1516	0.1768	0.2059	0.2779	0.3222	0.3730	0.4311	0.4977
16	0.0958	0.1133	0.1337	0.1575	0.1853	0.2552	0.2988	0.3492	0.4076	0.4751
17	0.0827	0.0988	0.1179	0.1403	0.1668	0.2343	0.2770	0.3270	0.3854	0.4535
18	0.0714	0.0863	0.1039	0.1250	0.1501	0.2151	0.2569	0.3062	0.3644	0.4329
19	0.0617	0.0753	0.0917	0.1114	0.1351	0.1975	0.2382	0.2867	0.3445	0.4132
20	0.0533	0.0657	0.0808	0.0992	0.1216	0.1814	0.2209	0.2685	0.3257	0.3944
21	0.0460	0.0573	0.0713	0.0884	0.1094	0.1665	0.2048	0.2514	0.3079	0.3765
22	0.0397	0.0500	0.0629	0.0788	0.0985	0.1529	0.1899	0.2354	0.2911	0.3594
23	0.0343	0.0437	0.0554	0.0702	0.0886	0.1404	0.1761	0.2204	0.2753	0.3430
24	0.0296	0.0381	0.0489	0.0625	0.0798	0.1289	0.1633	0.2064	0.2602	0.3274
25	0.0256	0.0333	0.0431	0.0557	0.0718	0.1184	0.1514	0.1932	0.2460	0.3125
26	0.0221	0.0290	0.0380	0.0496	0.0646	0.1087	0.1404	0.1809	0.2326	0.2983
27	0.0191	0.0253	0.0335	0.0442	0.0581	0.0998	0.1302	0.1694	0.2199	0.2848
28	0.0165	0.0221	0.0296	0.0394	0.0523	0.0916	0.1207	0.1587	0.2079	0.2718
29	0.0142	0.0193	0.0261	0.0351	0.0471	0.0841	0.1119	0.1486	0.1966	0.2595
30	0.0123	0.0168	0.0230	0.0313	0.0424	0.0772	0.1038	0.1391	0.1859	0.2477
35	0.0059	0.0085	0.0123	0.0175	0.0250	0.0504	0.0712	0.1001	0.1404	0.1963
40	0.0028	0.0043	0.0065	0.0098	0.0148	0.0329	0.0488	0.0721	0.1061	0.1555
45	0.0014	0.0022	0.0035	0.0055	0.0087	0.0215	0.0334	0.0519	0.0801	0.1233
50	0.0007	0.0011	0.0019	0.0031	0.0052	0.0140	0.0229	0.0373	0.0605	0.0977

Notes: <1> Tabulated SPW Factors Valid for Indefinite Period (Not Calendar-Dependent)
<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design (Discount Rate = 10%).
<3> Covers Costs such as Construction, Procurement, Replacement, Disposal

Table NE-2-1. Present Worth Factors--Annually Recurring Costs
Zero Differential Escalation (e = 0%)

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9091	0.8264	0.7513	0.6830	0.6209	0.5645	0.5132	0.4665	0.4241	0.3855
2	1.7355	1.5778	1.4343	1.3039	1.1854	1.0776	0.9797	0.8906	0.8096	0.7360
3	2.4869	2.2608	2.0552	1.8684	1.6986	1.5441	1.4038	1.2761	1.1601	1.0547
4	3.1699	2.8817	2.6197	2.3816	2.1651	1.9682	1.7893	1.6266	1.4788	1.3443
5	3.7908	3.4462	3.1329	2.8481	2.5892	2.3538	2.1398	1.9453	1.7684	1.6077
6	4.3553	3.9593	3.5994	3.2722	2.9747	2.7043	2.4584	2.2349	2.0318	1.8471
7	4.8684	4.4258	4.0235	3.6577	3.3252	3.0229	2.7481	2.4983	2.2712	2.0647
8	5.3349	4.8499	4.4090	4.0082	3.6438	3.3126	3.0114	2.7377	2.4888	2.2625
9	5.7590	5.2355	4.7595	4.3268	3.9335	3.5759	3.2508	2.9553	2.6866	2.4424
10	6.1446	5.5860	5.0782	4.6165	4.1968	3.8153	3.4684	3.1531	2.8665	2.6059
11	6.4951	5.9046	5.3678	4.8798	4.4362	4.0329	3.6663	3.3330	3.0300	2.7545
12	6.8137	6.1943	5.6312	5.1192	4.6538	4.2308	3.8462	3.4965	3.1786	2.8897
13	7.1034	6.4576	5.8705	5.3369	4.8517	4.4106	4.0097	3.6451	3.3138	3.0125
14	7.3667	6.6970	6.0882	5.5347	5.0315	4.5741	4.1583	3.7803	3.4366	3.1242
15	7.6061	6.9146	6.2860	5.7146	5.1951	4.7228	4.2934	3.9031	3.5483	3.2257
16	7.8237	7.1125	6.4659	5.8781	5.3437	4.8579	4.4163	4.0148	3.6498	3.3180
17	8.0216	7.2923	6.6294	6.0267	5.4788	4.9808	4.5280	4.1163	3.7421	3.4019
18	8.2014	7.4558	6.7780	6.1618	5.6017	5.0924	4.6295	4.2086	3.8260	3.4782
19	8.3649	7.6045	6.9132	6.2847	5.7134	5.1940	4.7218	4.2925	3.9023	3.5475
20	8.5136	7.7396	7.0360	6.3964	5.8149	5.2863	4.8057	4.3688	3.9716	3.6106
21	8.6487	7.8624	7.1477	6.4979	5.9072	5.3702	4.8820	4.4381	4.0347	3.6679
22	8.7715	7.9741	7.2492	6.5902	5.9911	5.4464	4.9513	4.5012	4.0920	3.7200
23	8.8832	8.0757	7.3415	6.6741	6.0674	5.5158	5.0143	4.5585	4.1441	3.7674
24	8.9847	8.1679	7.4254	6.7504	6.1367	5.5788	5.0717	4.6106	4.1914	3.8104
25	9.0770	8.2519	7.5017	6.8197	6.1997	5.6361	5.1238	4.6580	4.2345	3.8496
30	9.4269	8.5699	7.7908	7.0826	6.4387	5.8534	5.3212	4.8375	4.3977	3.9979
35	9.6442	8.7674	7.9704	7.2458	6.5871	5.9883	5.4439	4.9490	4.4991	4.0901
40	9.7791	8.8900	8.0819	7.3471	6.6792	6.0720	5.5200	5.0182	4.5620	4.1473
45	9.8628	8.9662	8.1511	7.4101	6.7364	6.1240	5.5673	5.0612	4.6011	4.1828
50	9.9148	9.0135	8.1941	7.4491	6.7720	6.1563	5.5967	5.0879	4.6253	4.2048

Notes: <1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.

<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design (Discount Rate = 10%).

<3> Covers Costs such as Routine Maintenance & Repair and Custodial.

Table NE-2-2. Present Worth Factors--Annually Recurring Costs
Non-Zero Differential Escalation (e = -5%)

Number of Payments	\ Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.8636	0.7459	0.6442	0.5563	0.4805	0.4149	0.3584	0.3095	0.2673	0.2308
2	1.6095	1.3900	1.2005	1.0368	0.8954	0.7733	0.6678	0.5768	0.4981	0.4302
3	2.2537	1.9463	1.6809	1.4517	1.2538	1.0828	0.9351	0.8076	0.6975	0.6024
4	2.8100	2.4268	2.0959	1.8101	1.5632	1.3501	1.1660	1.0070	0.8697	0.7511
5	3.2904	2.8417	2.4542	2.1196	1.8305	1.5809	1.3653	1.1792	1.0184	0.8795
6	3.7054	3.2001	2.7637	2.3869	2.0614	1.7803	1.5375	1.3279	1.1468	0.9904
7	4.0637	3.5096	3.0310	2.6177	2.2607	1.9525	1.6862	1.4563	1.2577	1.0862
8	4.3732	3.7769	3.2618	2.8171	2.4329	2.1011	1.8146	1.5672	1.3535	1.1689
9	4.6405	4.0077	3.4612	2.9892	2.5816	2.2296	1.9255	1.6630	1.4362	1.2404
10	4.8714	4.2071	3.6334	3.1379	2.7100	2.3405	2.0213	1.7457	1.5076	1.3021
11	5.0707	4.3793	3.7821	3.2663	2.8209	2.4363	2.1040	1.8171	1.5693	1.3553
12	5.2429	4.5279	3.9105	3.3773	2.9167	2.5190	2.1755	1.8788	1.6226	1.4014
13	5.3916	4.6564	4.0214	3.4730	2.9994	2.5904	2.2372	1.9321	1.6686	1.4411
14	5.5200	4.7673	4.1172	3.5558	3.0709	2.6521	2.2905	1.9781	1.7084	1.4754
15	5.6309	4.8631	4.1999	3.6272	3.1326	2.7054	2.3365	2.0179	1.7427	1.5051
16	5.7267	4.9458	4.2714	3.6889	3.1859	2.7514	2.3762	2.0522	1.7724	1.5307
17	5.8094	5.0172	4.3331	3.7422	3.2319	2.7912	2.4106	2.0818	1.7980	1.5528
18	5.8809	5.0789	4.3863	3.7882	3.2716	2.8255	2.4402	2.1075	1.8201	1.5719
19	5.9426	5.1322	4.4324	3.8280	3.3060	2.8551	2.4658	2.1296	1.8392	1.5884
20	5.9959	5.1782	4.4721	3.8623	3.3356	2.8807	2.4879	2.1487	1.8557	1.6026
21	6.0419	5.2180	4.5064	3.8919	3.3612	2.9029	2.5070	2.1651	1.8699	1.6149
22	6.0816	5.2523	4.5361	3.9175	3.3833	2.9220	2.5235	2.1794	1.8822	1.6255
23	6.1159	5.2819	4.5617	3.9396	3.4024	2.9384	2.5377	2.1917	1.8928	1.6347
24	6.1456	5.3076	4.5838	3.9587	3.4189	2.9527	2.5501	2.2023	1.9020	1.6426
25	6.1712	5.3297	4.6029	3.9752	3.4331	2.9650	2.5607	2.2115	1.9099	1.6495
30	6.2554	5.4024	4.6657	4.0295	3.4800	3.0055	2.5956	2.2417	1.9360	1.6720
35	6.2959	5.4374	4.6959	4.0556	3.5025	3.0249	2.6124	2.2562	1.9485	1.6828
40	6.3154	5.4542	4.7104	4.0681	3.5133	3.0343	2.6205	2.2632	1.9545	1.6880
45	6.3247	5.4622	4.7174	4.0741	3.5185	3.0387	2.6244	2.2665	1.9574	1.6905
50	6.3292	5.4661	4.7207	4.0770	3.5210	3.0409	2.6262	2.2681	1.9588	1.6917

Notes: <1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.

<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design (Discount Rate = 10%).

<3> Covers Costs such as Routine Maintenance & Repair and Custodial.

Table NE-2-3.   Present Worth Factors--Annually Recurring Costs
Non-Zero Differential Escalation (e = -4%)

Beneficial Occupancy Date

Number of Payments	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.8727	0.7617	0.6647	0.5801	0.5063	0.4418	0.3856	0.3365	0.2937	0.2563
2	1.6344	1.4264	1.2448	1.0864	0.9481	0.8275	0.7221	0.6302	0.5500	0.4800
3	2.2991	2.0065	1.7511	1.5282	1.3337	1.1640	1.0158	0.8866	0.7737	0.6752
4	2.8792	2.5128	2.1930	1.9139	1.6703	1.4577	1.2722	1.1103	0.9690	0.8456
5	3.3855	2.9546	2.5786	2.2504	1.9640	1.7140	1.4959	1.3055	1.1393	0.9943
6	3.8273	3.3402	2.9151	2.5441	2.2203	1.9377	1.6911	1.4759	1.2880	1.1241
7	4.2130	3.6768	3.2088	2.8004	2.4440	2.1329	1.8615	1.6246	1.4178	1.2374
8	4.5495	3.9705	3.4651	3.0241	2.6392	2.3033	2.0102	1.7543	1.5311	1.3362
9	4.8432	4.2268	3.6888	3.2193	2.8096	2.4520	2.1399	1.8676	1.6299	1.4225
10	5.0995	4.4505	3.8841	3.3897	2.9583	2.5818	2.2532	1.9664	1.7162	1.4977
11	5.3232	4.6457	4.0544	3.5384	3.0881	2.6950	2.3520	2.0527	1.7914	1.5634
12	5.5184	4.8161	4.2031	3.6682	3.2013	2.7939	2.4383	2.1280	1.8571	1.6208
13	5.6888	4.9648	4.3329	3.7814	3.3002	2.8801	2.5136	2.1937	1.9145	1.6708
14	5.8375	5.0946	4.4462	3.8803	3.3864	2.9554	2.5793	2.2510	1.9645	1.7145
15	5.9673	5.2078	4.5450	3.9665	3.4617	3.0211	2.6366	2.3011	2.0082	1.7526
16	6.0805	5.3067	4.6313	4.0418	3.5274	3.0785	2.6867	2.3447	2.0463	1.7859
17	6.1794	5.3929	4.7065	4.1075	3.5848	3.1285	2.7303	2.3828	2.0796	1.8149
18	6.2656	5.4682	4.7722	4.1649	3.6348	3.1722	2.7685	2.4161	2.1086	1.8402
19	6.3409	5.5339	4.8296	4.2149	3.6785	3.2103	2.8017	2.4451	2.1339	1.8623
20	6.4066	5.5912	4.8796	4.2586	3.7166	3.2436	2.8307	2.4705	2.1560	1.8816
21	6.4640	5.6413	4.9233	4.2967	3.7498	3.2726	2.8561	2.4926	2.1753	1.8985
22	6.5140	5.6849	4.9614	4.3300	3.7789	3.2979	2.8782	2.5119	2.1922	1.9132
23	6.5577	5.7231	4.9947	4.3590	3.8042	3.3200	2.8975	2.5287	2.2069	1.9260
24	6.5958	5.7563	5.0237	4.3843	3.8263	3.3393	2.9143	2.5434	2.2197	1.9372
25	6.6291	5.7854	5.0490	4.4064	3.8456	3.3562	2.9290	2.5562	2.2309	1.9470
30	6.7417	5.8836	5.1348	4.4813	3.9109	3.4132	2.9788	2.5997	2.2688	1.9800
35	6.7987	5.9334	5.1782	4.5192	3.9440	3.4421	3.0040	2.6216	2.2880	1.9968
40	6.8275	5.9586	5.2002	4.5384	3.9608	3.4567	3.0167	2.6328	2.2977	2.0053
45	6.8422	5.9713	5.2113	4.5481	3.9692	3.4641	3.0232	2.6384	2.3026	2.0096
50	6.8496	5.9778	5.2170	4.5530	3.9735	3.4678	3.0265	2.6413	2.3051	2.0117

Notes: <1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.
<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design (Discount Rate = 10%).
<3> Covers Costs such as Routine Maintenance & Repair and Custodial.

Table NE-2-4.   Present Worth Factors--Annually Recurring Costs
Non-Zero Differential Escalation (e = -3%)

Beneficial Occupancy Date

Number of Payments	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.8818	0.7776	0.6857	0.6047	0.5332	0.4702	0.4146	0.3656	0.3224	0.2843
2	1.6594	1.4633	1.2904	1.1379	1.0034	0.8848	0.7802	0.6880	0.6067	0.5350
3	2.3451	2.0680	1.8236	1.6081	1.4180	1.2504	1.1027	0.9723	0.8574	0.7561
4	2.9498	2.6012	2.2938	2.0227	1.7836	1.5728	1.3870	1.2231	1.0785	0.9510
5	3.4830	3.0714	2.7084	2.3883	2.1061	1.8572	1.6377	1.4441	1.2735	1.1230
6	3.9532	3.4860	3.0740	2.7107	2.3904	2.1079	1.8588	1.6391	1.4454	1.2746
7	4.3678	3.8516	3.3964	2.9950	2.6411	2.3289	2.0537	1.8110	1.5970	1.4082
8	4.7334	4.1740	3.6807	3.2457	2.8622	2.5239	2.2256	1.9626	1.7306	1.5261
9	5.0558	4.4583	3.9314	3.4668	3.0571	2.6958	2.3772	2.0963	1.8485	1.6301
10	5.3402	4.7090	4.1525	3.6618	3.2290	2.8474	2.5109	2.2142	1.9525	1.7217
11	5.5909	4.9301	4.3475	3.8337	3.3806	2.9811	2.6288	2.3181	2.0441	1.8026
12	5.8119	5.1251	4.5194	3.9853	3.5143	3.0990	2.7327	2.4098	2.1250	1.8738
13	6.0069	5.2970	4.6710	4.1190	3.6322	3.2029	2.8244	2.4906	2.1963	1.9367
14	6.1788	5.4486	4.8047	4.2368	3.7361	3.2946	2.9052	2.5619	2.2591	1.9921
15	6.3304	5.5823	4.9225	4.3408	3.8278	3.3754	2.9765	2.6247	2.3145	2.0410
16	6.4641	5.7001	5.0265	4.4325	3.9086	3.4467	3.0394	2.6802	2.3634	2.0841
17	6.5820	5.8041	5.1182	4.5133	3.9799	3.5095	3.0948	2.7290	2.4065	2.1221
18	6.6859	5.8958	5.1990	4.5846	4.0428	3.5650	3.1437	2.7721	2.4445	2.1556
19	6.7776	5.9766	5.2703	4.6474	4.0982	3.6138	3.1868	2.8101	2.4780	2.1852
20	6.8584	6.0479	5.3331	4.7028	4.1471	3.6569	3.2248	2.8437	2.5076	2.2112
21	6.9297	6.1107	5.3885	4.7517	4.1902	3.6950	3.2583	2.8732	2.5336	2.2342
22	6.9925	6.1662	5.4374	4.7948	4.2282	3.7285	3.2878	2.8993	2.5566	2.2545
23	7.0480	6.2150	5.4805	4.8328	4.2617	3.7580	3.3139	2.9223	2.5769	2.2724
24	7.0968	6.2581	5.5185	4.8663	4.2912	3.7841	3.3369	2.9425	2.5948	2.2881
25	7.1399	6.2961	5.5520	4.8959	4.3173	3.8071	3.3571	2.9604	2.6105	2.3020
30	7.2901	6.4285	5.6688	4.9988	4.4081	3.8871	3.4277	3.0226	2.6654	2.3504
35	7.3701	6.4991	5.7310	5.0537	4.4565	3.9298	3.4654	3.0558	2.6947	2.3762
40	7.4128	6.5367	5.7642	5.0830	4.4823	3.9525	3.4854	3.0735	2.7103	2.3900
45	7.4355	6.5568	5.7819	5.0986	4.4960	3.9647	3.4961	3.0829	2.7186	2.3973
50	7.4477	6.5675	5.7913	5.1069	4.5034	3.9711	3.5018	3.0880	2.7230	2.4012

Notes: <1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.
<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design (Discount Rate = 10%).
<3> Covers Costs such as Routine Maintenance & Repair and Custodial.

Table NE-2-5.   Present Worth Factors--Annually Recurring Costs
Non-Zero Differential Escalation (e = -2%)

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.8909	0.7937	0.7071	0.6300	0.5613	0.5000	0.4455	0.3969	0.3536	0.3150
2	1.6846	1.5009	1.3371	1.1913	1.0613	0.9455	0.8424	0.7505	0.6686	0.5957
3	2.3918	2.1308	1.8984	1.6913	1.5068	1.3424	1.1960	1.0655	0.9493	0.8457
4	3.0217	2.6921	2.3984	2.1368	1.9037	1.6960	1.5110	1.3461	1.1993	1.0685
5	3.5830	3.1921	2.8439	2.5337	2.2573	2.0110	1.7916	1.5962	1.4221	1.2669
6	4.0830	3.6376	3.2408	2.8873	2.5723	2.2917	2.0417	1.8189	1.6205	1.4437
7	4.5285	4.0345	3.5944	3.2023	2.8529	2.5417	2.2644	2.0174	1.7973	1.6012
8	4.9254	4.3881	3.9094	3.4829	3.1030	2.7645	2.4629	2.1942	1.9548	1.7416
9	5.2790	4.7031	4.1901	3.7330	3.3257	2.9629	2.6397	2.3517	2.0952	1.8666
10	5.5940	4.9838	4.4401	3.9557	3.5242	3.1397	2.7972	2.4921	2.2202	1.9780
11	5.8747	5.2338	4.6628	4.1542	3.7010	3.2972	2.9375	2.6171	2.3316	2.0772
12	6.1247	5.4566	4.8613	4.3310	3.8585	3.4376	3.0626	2.7285	2.4308	2.1656
13	6.3475	5.6550	5.0381	4.4885	3.9988	3.5626	3.1740	2.8277	2.5192	2.2444
14	6.5459	5.8318	5.1956	4.6288	4.1239	3.6740	3.2732	2.9161	2.5980	2.3146
15	6.7227	5.9893	5.3360	4.7539	4.2353	3.7732	3.3616	2.9949	2.6682	2.3771
16	6.8803	6.1297	5.4610	4.8652	4.3345	3.8616	3.4404	3.0651	2.7307	2.4328
17	7.0206	6.2547	5.5724	4.9645	4.4229	3.9404	3.5105	3.1276	2.7864	2.4824
18	7.1456	6.3661	5.6716	5.0529	4.5017	4.0106	3.5731	3.1833	2.8360	2.5266
19	7.2570	6.4653	5.7600	5.1317	4.5718	4.0731	3.6288	3.2329	2.8802	2.5660
20	7.3562	6.5537	5.8388	5.2018	4.6344	4.1288	3.6784	3.2771	2.9196	2.6011
21	7.4447	6.6325	5.9090	5.2643	4.6901	4.1784	3.7226	3.3165	2.9547	2.6324
22	7.5234	6.7027	5.9715	5.3200	4.7397	4.2226	3.7620	3.3516	2.9859	2.6602
23	7.5936	6.7652	6.0272	5.3697	4.7839	4.2620	3.7971	3.3828	3.0138	2.6850
24	7.6561	6.8209	6.0768	5.4139	4.8233	4.2971	3.8283	3.4107	3.0386	2.7071
25	7.7118	6.8705	6.1210	5.4533	4.8584	4.3284	3.8562	3.4355	3.0607	2.7268
30	7.9114	7.0483	6.2794	5.5944	4.9841	4.4404	3.9560	3.5244	3.1399	2.7974
35	8.0234	7.1481	6.3683	5.6736	5.0546	4.5032	4.0120	3.5743	3.1844	2.8370
40	8.0862	7.2041	6.4182	5.7180	5.0943	4.5385	4.0434	3.6023	3.2093	2.8592
45	8.1215	7.2355	6.4462	5.7430	5.1165	4.5583	4.0610	3.6180	3.2233	2.8717
50	8.1413	7.2532	6.4619	5.7570	5.1290	4.5694	4.0710	3.6268	3.2312	2.8787

Notes: <1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.
<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design (Discount Rate = 10%).
<3> Covers Costs such as Routine Maintenance & Repair and Custodial.

Table NE-2-6. Present Worth Factors--Annually Recurring Costs
Non-Zero Differential Escalation (e = -1%)

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9000	0.8100	0.7290	0.6561	0.5905	0.5314	0.4783	0.4305	0.3874	0.3487
2	1.7100	1.5390	1.3851	1.2466	1.1219	1.0097	0.9088	0.8179	0.7361	0.6625
3	2.4390	2.1951	1.9756	1.7780	1.6002	1.4402	1.2962	1.1666	1.0499	0.9449
4	3.0951	2.7856	2.5070	2.2563	2.0307	1.8276	1.6449	1.4804	1.3323	1.1991
5	3.6856	3.3170	2.9853	2.6868	2.4181	2.1763	1.9587	1.7628	1.5865	1.4279
6	4.2170	3.7953	3.4158	3.0742	2.7668	2.4901	2.2411	2.0170	1.8153	1.6338
7	4.6953	4.2258	3.8032	3.4229	3.0806	2.7725	2.4953	2.2458	2.0212	1.8191
8	5.1258	4.6132	4.1519	3.7367	3.3630	3.0267	2.7241	2.4517	2.2065	1.9858
9	5.5132	4.9619	4.4657	4.0191	3.6172	3.2555	2.9299	2.6370	2.3733	2.1359
10	5.8619	5.2757	4.7481	4.2733	3.8460	3.4614	3.1153	2.8037	2.5234	2.2710
11	6.1757	5.5581	5.0023	4.5021	4.0519	3.6467	3.2820	2.9538	2.6584	2.3926
12	6.4581	5.8123	5.2311	4.7080	4.2372	3.8135	3.4321	3.0889	2.7800	2.5020
13	6.7123	6.0411	5.4370	4.8933	4.4040	3.9636	3.5672	3.2105	2.8894	2.6005
14	6.9411	6.2470	5.6223	5.0601	4.5540	4.0986	3.6888	3.3199	2.9879	2.6891
15	7.1470	6.4323	5.7891	5.2101	4.6891	4.2202	3.7982	3.4184	3.0765	2.7689
16	7.3323	6.5991	5.9391	5.3452	4.8107	4.3296	3.8967	3.5070	3.1563	2.8407
17	7.4991	6.7491	6.0742	5.4668	4.9201	4.4281	3.9853	3.5868	3.2281	2.9053
18	7.6491	6.8842	6.1958	5.5762	5.0186	4.5167	4.0651	3.6586	3.2927	2.9634
19	7.7842	7.0058	6.3052	5.6747	5.1072	4.5965	4.1369	3.7232	3.3509	3.0158
20	7.9058	7.1152	6.4037	5.7633	5.1870	4.6683	4.2015	3.7813	3.4032	3.0629
21	8.0152	7.2137	6.4923	5.8431	5.2588	4.7329	4.2596	3.8337	3.4503	3.1053
22	8.1137	7.3023	6.5721	5.9149	5.3234	4.7911	4.3120	3.8808	3.4927	3.1434
23	8.2023	7.3821	6.6439	5.9795	5.3816	4.8434	4.3591	3.9232	3.5308	3.1778
24	8.2821	7.4539	6.7085	6.0377	5.4339	4.8905	4.4014	3.9613	3.5652	3.2087
25	8.3539	7.5185	6.7667	6.0900	5.4810	4.9329	4.4396	3.9956	3.5961	3.2365
30	8.6185	7.7566	6.9810	6.2829	5.6546	5.0891	4.5802	4.1222	3.7100	3.3390
35	8.7747	7.8972	7.1075	6.3968	5.7571	5.1814	4.6632	4.1969	3.7772	3.3995
40	8.8670	7.9803	7.1822	6.4640	5.8176	5.2359	4.7123	4.2410	3.8169	3.4352
45	8.9214	8.0293	7.2264	6.5037	5.8534	5.2680	4.7412	4.2671	3.8404	3.4564
50	8.9536	8.0583	7.2524	6.5272	5.8745	5.2870	4.7583	4.2825	3.8542	3.4688

Notes:
<1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.
<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design (Discount Rate = 10%).
<3> Covers Costs such as Routine Maintenance & Repair and Custodial.

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Table NE-2-7. Present Worth Factors--Annually Recurring Costs
Non-Zero Differential Escalation (e = 1%)

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9182	0.8431	0.7741	0.7107	0.6526	0.5992	0.5502	0.5052	0.4638	0.4259
2	1.7612	1.6171	1.4848	1.3633	1.2518	1.1494	1.0553	0.9690	0.8897	0.8169
3	2.5353	2.3279	2.1374	1.9625	1.8020	1.6545	1.5192	1.3949	1.2807	1.1760
4	3.2461	2.9805	2.7366	2.5127	2.3071	2.1184	1.9450	1.7859	1.6398	1.5056
5	3.8987	3.5797	3.2868	3.0179	2.7710	2.5442	2.3361	2.1449	1.9695	1.8083
6	4.4979	4.1299	3.7920	3.4817	3.1968	2.9353	2.6951	2.4746	2.2721	2.0862
7	5.0480	4.6350	4.2558	3.9076	3.5879	3.2943	3.0248	2.7773	2.5501	2.3414
8	5.5532	5.0988	4.6817	4.2986	3.9469	3.6240	3.3275	3.0552	2.8053	2.5757
9	6.0170	5.5247	5.0727	4.6577	4.2766	3.9267	3.6054	3.3104	3.0396	2.7909
10	6.4429	5.9158	5.4317	4.9873	4.5793	4.2046	3.8606	3.5447	3.2547	2.9884
11	6.8339	6.2748	5.7614	5.2900	4.8572	4.4598	4.0949	3.7599	3.4522	3.1698
12	7.1930	6.6045	6.0641	5.5679	5.1124	4.6941	4.3100	3.9574	3.6336	3.3363
13	7.5226	6.9072	6.3420	5.8231	5.3467	4.9092	4.5076	4.1388	3.8001	3.4892
14	7.8253	7.1851	6.5972	6.0574	5.5618	5.1068	4.6889	4.3053	3.9531	3.6296
15	8.1033	7.4403	6.8315	6.2726	5.7594	5.2881	4.8555	4.4582	4.0935	3.7585
16	8.3585	7.6746	7.0467	6.4701	5.9407	5.4547	5.0084	4.5986	4.2224	3.8769
17	8.5928	7.8897	7.2442	6.6515	6.1073	5.6076	5.1488	4.7275	4.3407	3.9856
18	8.8079	8.0873	7.4256	6.8180	6.2602	5.7480	5.2777	4.8459	4.4494	4.0854
19	9.0054	8.2686	7.5921	6.9709	6.4006	5.8769	5.3961	4.9546	4.5492	4.1770
20	9.1868	8.4352	7.7450	7.1113	6.5295	5.9953	5.5047	5.0544	4.6408	4.2611
21	9.3533	8.5881	7.8854	7.2402	6.6479	6.1039	5.6045	5.1460	4.7249	4.3384
22	9.5063	8.7285	8.0143	7.3586	6.7565	6.2037	5.6961	5.2301	4.8022	4.4093
23	9.6466	8.8574	8.1327	7.4673	6.8563	6.2954	5.7803	5.3073	4.8731	4.4744
24	9.7756	8.9757	8.2414	7.5671	6.9479	6.3795	5.8575	5.3783	4.9382	4.5342
25	9.8939	9.0844	8.3411	7.6587	7.0321	6.4567	5.9284	5.4434	4.9980	4.5891
30	10.3554	9.5081	8.7302	8.0159	7.3601	6.7579	6.2049	5.6973	5.2311	4.8031
35	10.6565	9.7846	8.9841	8.2490	7.5741	6.9544	6.3854	5.8630	5.3833	4.9428
40	10.8531	9.9651	9.1498	8.4011	7.7138	7.0826	6.5032	5.9711	5.4825	5.0340
45	10.9813	10.0828	9.2579	8.5004	7.8049	7.1663	6.5800	6.0416	5.5473	5.0935
50	11.0650	10.1597	9.3284	8.5652	7.8644	7.2210	6.6302	6.0877	5.5896	5.1323

Notes: <1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.

<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design (Discount Rate = 10%).

<3> Covers Costs such as Routine Maintenance & Repair and Custodial.

Table NE-2-8. Present Worth Factors--Annually Recurring Costs
Non-Zero Differential Escalation (e = 2%)

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9273	0.8598	0.7973	0.7393	0.6855	0.6357	0.5895	0.5466	0.5068	0.4700
2	1.7871	1.6571	1.5366	1.4249	1.3212	1.2251	1.1360	1.0534	0.9768	0.9058
3	2.5844	2.3965	2.2222	2.0606	1.9107	1.7717	1.6429	1.5234	1.4126	1.3099
4	3.3237	3.0820	2.8579	2.6500	2.4573	2.2786	2.1129	1.9592	1.8167	1.6846
5	4.0093	3.7177	3.4473	3.1966	2.9641	2.7485	2.5487	2.3633	2.1914	2.0320
6	4.6450	4.3071	3.9939	3.7034	3.4341	3.1843	2.9528	2.7380	2.5389	2.3542
7	5.2344	4.8537	4.5007	4.1734	3.8699	3.5884	3.3275	3.0855	2.8611	2.6530
8	5.7810	5.3606	4.9707	4.6092	4.2740	3.9632	3.6749	3.4077	3.1598	2.9300
9	6.2878	5.8305	5.4065	5.0133	4.6487	4.3106	3.9971	3.7064	3.4369	3.1869
10	6.7578	6.2663	5.8106	5.3880	4.9962	4.6328	4.2959	3.9834	3.6937	3.4251
11	7.1936	6.6704	6.1853	5.7355	5.3184	4.9316	4.5729	4.2403	3.9319	3.6460
12	7.5977	7.0452	6.5328	6.0577	5.6171	5.2086	4.8298	4.4785	4.1528	3.8508
13	7.9724	7.3926	6.8550	6.3564	5.8941	5.4655	5.0680	4.6994	4.3576	4.0407
14	8.3199	7.7148	7.1537	6.6335	6.1510	5.7037	5.2889	4.9042	4.5475	4.2168
15	8.6421	8.0136	7.4308	6.8903	6.3892	5.9246	5.4937	5.0941	4.7237	4.3801
16	8.9408	8.2906	7.6876	7.1285	6.6101	6.1294	5.6836	5.2702	4.8869	4.5315
17	9.2179	8.5475	7.9258	7.3494	6.8149	6.3193	5.8597	5.4335	5.0384	4.6719
18	9.4747	8.7857	8.1467	7.5542	7.0048	6.4954	6.0230	5.5850	5.1788	4.8021
19	9.7129	9.0066	8.3515	7.7441	7.1809	6.6587	6.1744	5.7254	5.3090	4.9229
20	9.9338	9.2114	8.5414	7.9202	7.3442	6.8101	6.3148	5.8556	5.4297	5.0348
21	10.1386	9.4013	8.7176	8.0835	7.4957	6.9505	6.4450	5.9763	5.5417	5.1386
22	10.3286	9.5774	8.8808	8.2350	7.6361	7.0807	6.5658	6.0882	5.6455	5.2349
23	10.5047	9.7407	9.0323	8.3754	7.7663	7.2014	6.6777	6.1920	5.7417	5.3241
24	10.6680	9.8921	9.1727	8.5056	7.8870	7.3134	6.7815	6.2883	5.8310	5.4069
25	10.8194	10.0325	9.3029	8.6263	7.9989	7.4172	6.8778	6.3776	5.9137	5.4836
30	11.4265	10.5955	9.8249	9.1103	8.4478	7.8334	7.2637	6.7354	6.2456	5.7913
35	11.8427	10.9814	10.1827	9.4422	8.7555	8.1187	7.5282	6.9807	6.4731	6.0023
40	12.1280	11.2459	10.4281	9.6696	8.9664	8.3143	7.7096	7.1489	6.6290	6.1469
45	12.3236	11.4273	10.5962	9.8256	9.1110	8.4484	7.8340	7.2642	6.7359	6.2460
50	12.4577	11.5517	10.7115	9.9325	9.2101	8.5403	7.9192	7.3433	6.8092	6.3140

Notes: <1> Data Based on Assumed DOS of Apr 1993.
         Authorized Period of Use of Table is Oct 1992 through Sep 1993.
        <2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
             of Agreement on Criteria/Standards for EA/LCC for MILCON Design (Discount Rate = 10%).
        <3> Covers Costs such as Routine Maintenance & Repair and Custodial.

Table NE-2-9. Present Worth Factors--Annually Recurring Costs
Non-Zero Differential Escalation (e = 3%)

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9364	0.8768	0.8210	0.7687	0.7198	0.6740	0.6311	0.5910	0.5534	0.5181
2	1.8131	1.6978	1.5897	1.4886	1.3938	1.3051	1.2221	1.1443	1.0715	1.0033
3	2.6341	2.4665	2.3095	2.1626	2.0249	1.8961	1.7754	1.6624	1.5567	1.4576
4	3.4029	3.1863	2.9835	2.7937	2.6159	2.4494	2.2936	2.1476	2.0109	1.8830
5	4.1227	3.8603	3.6147	3.3846	3.1693	2.9676	2.7787	2.6019	2.4363	2.2813
6	4.7967	4.4914	4.2056	3.9380	3.6874	3.4527	3.2330	3.0273	2.8346	2.6543
7	5.4278	5.0824	4.7590	4.4561	4.1726	3.9070	3.6584	3.4256	3.2076	3.0035
8	6.0188	5.6358	5.2771	4.9413	4.6269	4.3324	4.0567	3.7986	3.5568	3.3305
9	6.5721	6.1539	5.7623	5.3956	5.0522	4.7307	4.4297	4.1478	3.8838	3.6367
10	7.0903	6.6391	6.2166	5.8210	5.4505	5.1037	4.7789	4.4748	4.1900	3.9234
11	7.5754	7.0933	6.6420	6.2193	5.8235	5.4529	5.1059	4.7810	4.4768	4.1919
12	8.0297	7.5187	7.0403	6.5922	6.1727	5.7799	5.4121	5.0677	4.7452	4.4433
13	8.4551	7.9170	7.4132	6.9415	6.4997	6.0861	5.6988	5.3362	4.9966	4.6786
14	8.8534	8.2900	7.7625	7.2685	6.8059	6.3728	5.9673	5.5876	5.2320	4.8990
15	9.2264	8.6392	8.0895	7.5747	7.0927	6.6413	6.2187	5.8229	5.4524	5.1054
16	9.5756	8.9662	8.3957	7.8614	7.3611	6.8927	6.4541	6.0434	5.6588	5.2987
17	9.9026	9.2724	8.6824	8.1299	7.6125	7.1281	6.6745	6.2497	5.8520	5.4796
18	10.2088	9.5592	8.9508	8.3812	7.8479	7.3485	6.8809	6.4430	6.0330	5.6491
19	10.4955	9.8276	9.2022	8.6166	8.0683	7.5549	7.0741	6.6239	6.2024	5.8077
20	10.7640	10.0790	9.4376	8.8370	8.2747	7.7481	7.2550	6.7934	6.3611	5.9563
21	11.0154	10.3144	9.6580	9.0434	8.4679	7.9291	7.4245	6.9520	6.5096	6.0954
22	11.2508	10.5348	9.8644	9.2367	8.6489	8.0985	7.5831	7.1006	6.6487	6.2256
23	11.4712	10.7412	10.0576	9.4176	8.8183	8.2571	7.7317	7.2397	6.7790	6.3476
24	11.6775	10.9344	10.2386	9.5871	8.9770	8.4057	7.8708	7.3699	6.9009	6.4618
25	11.8708	11.1154	10.4080	9.7457	9.1255	8.5448	8.0010	7.4919	7.0151	6.5687
30	12.6675	11.8614	11.1066	10.3998	9.7380	9.1183	8.5380	7.9947	7.4859	7.0096
35	13.2410	12.3984	11.6094	10.8706	10.1788	9.5311	8.9246	8.3566	7.8248	7.3269
40	13.6538	12.7849	11.9713	11.2095	10.4962	9.8282	9.2028	8.6172	8.0688	7.5553
45	13.9509	13.0631	12.2318	11.4534	10.7246	10.0421	9.4031	8.8047	8.2444	7.7197
50	14.1648	13.2634	12.4194	11.6290	10.8890	10.1961	9.5472	8.9397	8.3708	7.8381

Notes: <1> Data Based on Assumed DOS of Apr 1993.
           Authorized Period of Use of Table is Oct 1992 through Sep 1993.
        <2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
           of Agreement on Criteria/Standards for EA/LCC for MILCON Design (Discount Rate = 10%).
        <3> Covers Costs such as Routine Maintenance & Repair and Custodial.

Table NE-2-10. Present Worth Factors--Annually Recurring Costs
Non-Zero Differential Escalation (e = 4%)

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9455	0.8939	0.8451	0.7990	0.7554	0.7142	0.6753	0.6384	0.6036	0.5707
2	1.8393	1.7390	1.6442	1.5545	1.4697	1.3895	1.3137	1.2421	1.1743	1.1103
3	2.6845	2.5380	2.3996	2.2687	2.1450	2.0280	1.9174	1.8128	1.7139	1.6204
4	3.4835	3.2935	3.1138	2.9440	2.7834	2.6316	2.4880	2.3523	2.2240	2.1027
5	4.2389	4.0077	3.7891	3.5824	3.3870	3.2023	3.0276	2.8625	2.7063	2.5587
6	4.9532	4.6830	4.4276	4.1861	3.9577	3.7419	3.5378	3.3448	3.1623	2.9899
7	5.6285	5.3215	5.0312	4.7568	4.4973	4.2520	4.0201	3.8008	3.5935	3.3975
8	6.2669	5.9251	5.6019	5.2963	5.0074	4.7343	4.4761	4.2319	4.0011	3.7829
9	6.8705	6.4958	6.1415	5.8065	5.4898	5.1903	4.9072	4.6395	4.3865	4.1472
10	7.4412	7.0353	6.6516	6.2888	5.9458	5.6214	5.3148	5.0249	4.7508	4.4917
11	7.9808	7.5455	7.1339	6.7448	6.3769	6.0291	5.7002	5.3893	5.0953	4.8174
12	8.4909	8.0278	7.5899	7.1759	6.7845	6.4144	6.0646	5.7338	5.4210	5.1253
13	8.9733	8.4838	8.0210	7.5835	7.1699	6.7788	6.4091	6.0595	5.7289	5.4165
14	9.4293	8.9149	8.4287	7.9689	7.5342	7.1233	6.7347	6.3674	6.0201	5.6917
15	9.8604	9.3225	8.8140	8.3333	7.8787	7.4490	7.0427	6.6585	6.2953	5.9520
16	10.2680	9.7079	9.1784	8.6778	8.2044	7.7569	7.3338	6.9338	6.5556	6.1980
17	10.6534	10.0723	9.5229	9.0035	8.5124	8.0481	7.6091	7.1940	6.8016	6.4306
18	11.0177	10.4168	9.8486	9.3114	8.8035	8.3233	7.8693	7.4401	7.0343	6.6506
19	11.3622	10.7425	10.1565	9.6025	9.0788	8.5835	8.1154	7.6727	7.2542	6.8585
20	11.6879	11.0504	10.4477	9.8778	9.3390	8.8296	8.3480	7.8926	7.4621	7.0551
21	11.9959	11.3415	10.7229	10.1380	9.5850	9.0622	8.5679	8.1006	7.6587	7.2410
22	12.2870	11.6168	10.9832	10.3841	9.8177	9.2822	8.7759	8.2972	7.8446	7.4167
23	12.5622	11.8770	11.2292	10.6167	10.0376	9.4901	8.9725	8.4830	8.0203	7.5829
24	12.8225	12.1231	11.4618	10.8366	10.2455	9.6867	9.1583	8.6588	8.1865	7.7400
25	13.0685	12.3557	11.6818	11.0446	10.4421	9.8726	9.3341	8.8249	8.3436	7.8885
30	14.1115	13.3418	12.6141	11.9260	11.2755	10.6605	10.0790	9.5292	9.0095	8.5180
35	14.8994	14.0867	13.3184	12.5919	11.9051	11.2557	10.6418	10.0613	9.5125	8.9936
40	15.4946	14.6495	13.8504	13.0949	12.3807	11.7054	11.0669	10.4632	9.8925	9.3529
45	15.9443	15.0746	14.2524	13.4750	12.7400	12.0451	11.3881	10.7669	10.1796	9.6244
50	16.2840	15.3958	14.5560	13.7620	13.0114	12.3017	11.6307	10.9963	10.3965	9.8294

Notes: <1> Data Based on Assumed DOS of Apr 1993.
Authorized Period of Use of Table is Oct 1992 through Sep 1993.
<2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
of Agreement on Criteria/Standards for EA/LCC for MILCON Design (Discount Rate = 10%).
<3> Covers Costs such as Routine Maintenance & Repair and Custodial.

Table NE-2-11. Present Worth Factors--Annually Recurring Costs
Non-Zero Differential Escalation (e = 5%)

Number of Payments	Beneficial Occupancy Date									
	Oct 1993	Oct 1994	Oct 1995	Oct 1996	Oct 1997	Oct 1998	Oct 1999	Oct 2000	Oct 2001	Oct 2002
1	0.9545	0.9112	0.8697	0.8302	0.7925	0.7564	0.7221	0.6892	0.6579	0.6280
2	1.8657	1.7809	1.6999	1.6227	1.5489	1.4785	1.4113	1.3472	1.2859	1.2275
3	2.7354	2.6111	2.4924	2.3791	2.2710	2.1678	2.0692	1.9752	1.8854	1.7997
4	3.5657	3.4036	3.2489	3.1012	2.9602	2.8257	2.6972	2.5746	2.4576	2.3459
5	4.3581	4.1600	3.9709	3.7904	3.6181	3.4537	3.2967	3.1468	3.0038	2.8673
6	5.1146	4.8821	4.6602	4.4483	4.2462	4.0531	3.8689	3.6931	3.5252	3.3649
7	5.8366	5.5713	5.3181	5.0764	4.8456	4.6254	4.4151	4.2144	4.0229	3.8400
8	6.5259	6.2292	5.9461	5.6758	5.4178	5.1716	4.9365	4.7121	4.4979	4.2935
9	7.1838	6.8573	6.5456	6.2480	5.9640	5.6929	5.4342	5.1872	4.9514	4.7263
10	7.8118	7.4567	7.1178	6.7942	6.4854	6.1906	5.9092	5.6406	5.3842	5.1395
11	8.4113	8.0289	7.6640	7.3156	6.9831	6.6657	6.3627	6.0735	5.7974	5.5339
12	8.9835	8.5751	8.1854	7.8133	7.4582	7.1191	6.7955	6.4867	6.1918	5.9104
13	9.5297	9.0965	8.6830	8.2884	7.9116	7.5520	7.2087	6.8811	6.5683	6.2697
14	10.0511	9.5942	9.1581	8.7418	8.3445	7.9652	7.6031	7.2575	6.9276	6.6127
15	10.5487	10.0693	9.6116	9.1747	8.7576	8.3596	7.9796	7.6169	7.2707	6.9402
16	11.0238	10.5227	10.0444	9.5878	9.1520	8.7360	8.3389	7.9599	7.5981	7.2527
17	11.4773	10.9556	10.4576	9.9822	9.5285	9.0954	8.6820	8.2873	7.9106	7.5511
18	11.9101	11.3687	10.8520	10.3587	9.8879	9.4384	9.0094	8.5999	8.2090	7.8358
19	12.3233	11.7631	11.2285	10.7181	10.2309	9.7658	9.3219	8.8982	8.4938	8.1077
20	12.7177	12.1396	11.5878	11.0611	10.5583	10.0784	9.6203	9.1830	8.7656	8.3672
21	13.0942	12.4990	11.9308	11.3885	10.8709	10.3767	9.9051	9.4548	9.0251	8.6148
22	13.4535	12.8420	12.2583	11.7011	11.1692	10.6615	10.1769	9.7143	9.2728	8.8513
23	13.7965	13.1694	12.5708	11.9994	11.4540	10.9333	10.4364	9.9620	9.5092	9.0769
24	14.1240	13.4820	12.8692	12.2842	11.7258	11.1928	10.6841	10.1984	9.7349	9.2924
25	14.4365	13.7803	13.1539	12.5560	11.9853	11.4405	10.9205	10.4241	9.9503	9.4980
30	15.7986	15.0805	14.3950	13.7407	13.1161	12.5199	11.9509	11.4076	10.8891	10.3941
35	16.8781	16.1109	15.3786	14.6795	14.0123	13.3754	12.7674	12.1871	11.6331	11.1043
40	17.7335	16.9274	16.1580	15.4235	14.7225	14.0533	13.4145	12.8047	12.2227	11.6671
45	18.4114	17.5745	16.7757	16.0131	15.2853	14.5905	13.9273	13.2942	12.6899	12.1131
50	18.9486	18.0873	17.2652	16.4804	15.7313	15.0162	14.3337	13.6821	13.0602	12.4666

Notes: <1> Data Based on Assumed DOS of Apr 1993.
         Authorized Period of Use of Table is Oct 1992 through Sep 1993.
        <2> Tabulated Data Based on Criteria Contained in 18 Mar 91 Tri-Service Memorandum
         of Agreement on Criteria/Standards for EA/LCC for MILCON Design (Discount Rate = 10%).
        <3> Covers Costs such as Routine Maintenance & Repair and Custodial.

MEMORANDUM OF AGREEMENT
ON
CRITERIA/STANDARDS FOR ECONOMIC ANALYSES/LIFE CYCLE COSTING FOR MILCON DESIGN

1. <u>Purpose.</u> The purpose of this Memorandum of Agreement (MOA) is to establish criteria and standards for performing economic analyses and life cycle cost studies used in support of design decisions for projects in the Military Construction (MILCON) Program, i.e., to support the selection from various alternatives of components/systems being considered as elements in facilities design. These criteria and standards apply to all design decisions regardless of when they are made in the planning, programming, design, and procurement process. This agreement does not apply to economic analyses and life cycle studies used to make project-justification decisions during the planning and programming process.

2. <u>General.</u> Economic analyses shall be conducted as part of the design process to ensure that the selection/rejection of design alternatives is not based solely on construction costs, but also on least life cycle costs (LCC), that is, lowest total cost of ownership. The depth and degree of formality of these analyses shall be determined on a case-by-case basis to ensure that the cost of performing an analysis is clearly outweighed by the potential benefits derived. Results of generic studies or results of previous analyses of alternatives similar to those currently under consideration may be used in lieu of performing a new study provided the previous study was based on similar design conditions, criteria, and methods. Previous studies should be updated only as required to reflect changes of conditions significant enough to impact the design decision. All economic analyses and other justification for the selection of a design alternative, whether a previous study or a new one, shall be clearly documented in the appropriate section of the project design analysis.

3. <u>Methods.</u> All analyses shall consider the total LCC for design alternatives, where the LCC includes all costs and benefits associated with an alternative over its expected life, including but not limited to construction/procurement, energy, maintenance, operation, repair, replacement, alteration, disposal costs, and retention values. The present value discounting approach shall be used to adjust for the differences in timing of costs and benefits unless otherwise specified by other directives or by public law. The basic discount factor for finding the present value of a future amount is calculated as follows:

$$\text{Discount Factor} = \frac{1}{(1 + d)^n}$$

> where: d = appropriate discount rate, and
> n = the time period over which the discounting is done.

Discounting should be applied to all costs and benefits over the appropriate analysis period. Specific criteria are as follows:

a. <u>Discount Rates.</u> The discount rates are expressed in "real" terms, i.e., over-and-above the rate of inflation for the economy as a whole.

(1) <u>Non-energy related studies:</u> An annual "real" discount rate of 10% should be used in evaluating all non-energy related economic studies.

(2) Energy related studies: All energy related economic studies (studies in which energy costs are relevant, regardless of their magnitude relative to other costs) shall use the current discount rate published by the National Institute of Standards and Technology (NIST) in their annual supplement to NIST Handbook 135, and disseminated by the appropriate Service Headquarters Office.

b. Analysis Period: The analysis period shall be the date of the study (DOS) through the economic life of the facility as a whole. The economic life shall not be taken beyond 25 years from the scheduled beneficial occupancy date (BOD) for the project unless specifically approved by the appropriate Service Headquarters Office. Such approval cannot be granted for energy related studies as it is precluded by statute.

c. Cash Flow: In general, cash flow used in the analysis will be based on the estimated calendar dates on which the events and costs/benefits are projected/scheduled to occur. Construction/procurement costs may be assumed to be incurred as a single lump sum, preferably at the time corresponding to the midpoint of the construction/procurement process. Other cash flows that occur periodically throughout the year (e.g., cost of fuel, electricity, water, maintenance, etc.) may be assumed to be incurred as a single lump sum, preferably at midyear. In circumstances where the above assumptions add unnecessarily to the complexity of the calculations, all cash flows may be assumed to occur at the end of the year in which they are actually scheduled/projected to occur.

d. Benefits and Costs: All benefits and costs will be expressed in terms of constant dollars that reflect the purchasing power of the dollar on the DOS (i.e., constant DOS dollars). The rate of inflation of the economy as a whole will be excluded from all LCC calculations. (The rate of inflation is irrelevant to the LCC analysis results since all benefits and costs are expressed in terms of constant DOS dollars and discounted using a "real" discount rate which reflects the time value of money over-and-above the general rate of inflation.)
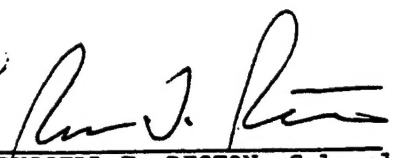
e. Future Benefits and Costs: In projecting future benefits and costs, an allowance for future price-level changes will be made only for particular benefits and costs expected to change at rates higher or lower than the general rate of inflation. In such cases, the rates of change used in the analysis will be the "differential" rates, i.e., the anticipated differences between the actual projected rates of change and the general inflation rate.
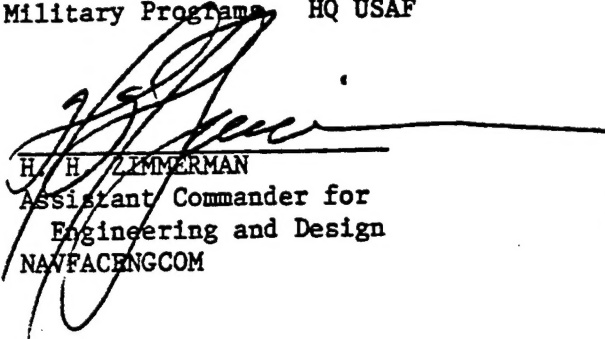
(1) Non-energy studies: For non-energy studies, the differential rate of future price-level change shall generally be assumed to be zero, except in those cases where there is reliable information/data to the contrary.

(2) Energy studies: Fuel/energy costs shall have differential escalation rates as published by NIST in Handbook 135 and disseminated as indicated in paragraph 3.a(2) above. All non-energy costs shall have a zero differential escalation rate.

4. Computer Aided Calculations. All computer aided calculations for MILCON design economic studies will be accomplished using the Life Cycle Cost In Design (LCCID), a computer program for economic analysis developed by the U.S. Army Corps of Engineers Construction Engineering Research Laboratory (CERL) or a version thereof which has been certified by CERL as equivalent.

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